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Student wellbeing in times of COVID-19

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Table of contents

Introduction

Student wellbeing

University students are a vulnerable group at risk for developing mental health problems. Although student life is often experienced as an exciting time, many students experience stress because of academic overload, pressure to succeed, little leisure time, spending less time with family, and worries about the future (Tosevski, Milovancevic, & Gajic, 2010). This places students at risk for developing various forms of mental health problems and disorders or makes pre-existing mental health problems even worse (Cleary, Walter, & Jackson, 2011). Some of the most frequently reported mental health problems include severe distress, learning burnout, loneliness, substance abuse (alcohol, prescription and illicit drugs), anxiety, depression and suicidal ideation (Tosevski, Milovancevic, & Gajic, 2010; Verhoog et al., 2020; Newcomb-Anjo, Villemaire-Krajden, Takefman, & Barker, 2017; Stolker & Lafreniere, 2015; Dyrbye et al., 2008). Mental health problems are found to have clear associations with lower academic functioning, such as reductions in academic year percentages and grade point averages (Bruffaerts et al., 2018; Stolker & Lafreniere, 2015) or result in study delay or even in university drop-out (Hartley, 2010). As students are seen as the national capital and top investment for the future, it is important to ensure a healthy learning environment.

Previous research indicates several factors related to the psychological wellbeing and distress of university students (Burris, Brechting, Salsman, & Carlson, 2009; Cleary, Walter, & Jackson, 2011). Examples of potential stressors include the loss of high school friends and the need to make new friends, potentially moving out of the parent's house, decreased parental oversight, and increased responsibility for and autonomy in life, health and studies (Cleary, Walter, & Jackson, 2011). In addition, some risky behaviors put university students even more at risk for the development or exacerbation of mental and physical health problems and consequently has further implications for their academic performance. Examples of these risky behaviors include substance use or misuse (e.g. alcohol, prescription and illegal drugs), eating problems, and sexual activity (Cleary, Walter, & Jackson, 2011).

In contrast, there are several factors which are protective in the wellbeing of students. On the individual level, these include for example having an optimistic attitude, engaging in health-promoting behaviors, and good sleep quality (Burris et al., 2009; Ridner, Newton, Staten, Crawford, & Hall, 2016). On the organizational level, Tinto's model of student retention helps to understand which determinants contribute to an adequately adjustment of the student life (Tinto, 1975). Being academically and socially integrated, which means having a high sense of belonging and commitment to the university, the study program and the responsible employees seem to be adequately adjusted to the study environment and student life. More specifically, students who had a greater sense of belonging on campus reported fewer instances of feeling stressed, depressed, or upset (Stebleton, Soria, & Huesman, 2014).

These factors are relevant for all students. Each semester, however, international students from all over the world move from their home countries, families, friends and other important people within their social support network to study at an exchange university. Although most international students quickly and successfully adapt to their "host" culture, some of them face challenges including adjusting to cultural and educational differences (Mclachlan & Justice, 2009). The latter is commonly referred to as "culture shock" and can be defined as "the anxiety that results from losing all of our familiar signs and symbols of social intercourse" (p. 177, Oberg, 1960). Previous research indicates that mental health counseling may not be socially acceptable or available in some of these international students' own

cultures, so it is possible that some students do not seek help when they are in need. They therefore suggest offering informal workshops for students to deal with various challenges, such as homesickness and loneliness, offering social activities or a buddy system of international students (Mclachlan & Justice, 2009). All in all, studying in a foreign country may place some students at more risk for the development of mental health problems.

Student wellbeing and COVID-19

As a result of the global pandemic because of the novel coronavirus (COVID-19) and resulting measures, such as distance learning, isolation from friends and/or family, and delays in study, it is expected that the mental health of university students will be influenced. Cao et al. (2020) confirmed this by finding that approximately 25 percent of students of a Chinese university experienced anxiety because of the COVID-2019 outbreak. They suggested that anxiety may result from the worries about the effect on their studies and future employment, and because of limited social contacts. Moreover, their study results indicated that the degree of students' anxiety was related to several factors, such as living in urban vs. rural areas, family income stability and living with parents (Cao et al., 2020). All in all, some risk and protective factors for mental health have been identified. However, as COVID-19 is a relatively new virus that struck many countries, only a limited number of studies have been conducted. It is therefore important to carry out more research to also map (other) factors that may facilitate or hinder student wellbeing.

In addition to a scientific need for more knowledge regarding this theme, doing research on the mental health of students and experiences after COVID-2019 is necessary to comply with Tilburg University's vision. Tilburg University wishes to be an inclusive learning community in which students are offered equal opportunities for study success. In addition, they want students to be the owner and coordinator of his or her own wellbeing, but feel a shared responsibility within the university to:

- Create conditions under which wellbeing can thrive
- Early detect when wellbeing of students comes under pressure
- Having an eye for the differences in starting positions of the diverse student population and the associated risks
- Provide support, advice and referral when there are barriers acting for the study progress and study success of the individual student or groups of students.

The integrated approach to live this vision is to focus on (1) prevention, which includes all activities aimed at creating conditions under which student welfare can thrive and at the early detection of problems, and (2) intervention, which includes any activity aimed at supporting students to increase opportunities for directing their wellbeing when it is put under pressure.

Relevance

COVID-19 has raided all of us and in this early stage little is known about the consequences of all measures taken to keep the virus under control. As students are already a vulnerable population for the development of mental health problems, it is even more important to create a safe learning environment for all students and to ensure the wellbeing of Tilburg University's students during these uncertain times. However, little is known about how students have experienced this period and what their needs and wishes are. For policy makers of Tilburg University, it is important to gather feedback on

this period and to systematically map students' health. By doing so, Tilburg University is able to adjust policies quickly where necessary and be better prepared for similar situations in the future.

Scientifically, this study is also relevant. A knowledge gap is present regarding student experiences during COVID-19 in European countries. It is unknown what factors may have promoted or hindered mental health of students in times of COVID-19. Through this study, current knowledge about student experiences and potential risk or protective factors can be extended. In addition, from this study, recommendations about future policy within universities can be made during this type of crisis.

Objectives and research questions

The objectives of the present study were twofold, namely (1) monitoring the wellbeing of Tilburg University students and (2) identifying which factors that are the result of the COVID-19 situation (e.g. online exams and social distancing) influence the wellbeing of students, in order to be able to adjust policy where necessary. These objectives are translated into the seven research questions below:

1. What is the **living situation** of students in times of COVID-19, and how different was it in times before COVID-19?
2. What is the **physical wellbeing** of students in times of COVID-19, and how different was it in times before COVID-19?
3. What is the **mental wellbeing** of students in times of COVID-19, and how different was it in times before COVID-19?
4. To what extent did students **feel connected with the university and with fellow students** during times of COVID-19, and to what extent was this different in times before COVID-19?
5. To what extent did students experience **(social) support from the university and from family, friends or other loved ones** during times of COVID-19, and to what extent was this different in times before COVID-19?
6. How has **distance education/learning (digital education and studying from home)** been experienced by students during times of COVID-19?
7. To what extent do the outcomes of questions 1-6 differ between national and **international** students, between various **study phases**, and (for some topics) between various **schools**?

Method

Study design

A quantitative study design was used by doing survey research. Data was gathered by CentERdata via their questionnaire software 'Quest'. Data collection took place from 13 August 2020 to 8 September 2020. This was a period where COVID-19-measures in the Netherlands were temporary relaxed. Analyses and report were done by the Academic Collaborative Center of Tranzo Scientific Center for Care and Wellbeing at the School of Social and Behavioral Sciences of Tilburg University.

Participants and setting

The questionnaire was distributed to students who attended education in the spring semester of the 2019-2020 school year (January – July). Students that fell into the following groups were contacted:

- First-year bachelor students (all directions)
- Second year bachelor students (all directions)
- Third year bachelor students (all directions)
- Master students (all directions)
- Extended master students (all directions)
- Pre-master students (spring semester) (all directions)

Procedure

This study was conducted online among students from Tilburg University. The students were sent an invitation email with a unique link with login code. The invitation email stated that it concerned a study into the experiences of students during the COVID-19 outbreak and the measures taken by Tilburg University. It was also mentioned that the results would be delivered to the Executive Board of Tilburg University, so that students could influence educational developments in the context of the corona measures with their participation. In the invitation e-mail, the time to complete the questionnaire was estimated at 15-20 minutes (looking only at students who fully completed the questionnaire are considered, the median was found to be 19 minutes).

Students first indicated in which language (Dutch/English) they wanted to complete the questionnaire. More than a third (36%) opted for the English version. On the next page, students were presented with an information letter explaining the purpose of the study, the duration and characteristics of the questionnaire, information about participation, and contact details. The information letter was followed by an informed consent with a checkbox at the end with the following text*: "I understand above text and voluntarily agree to participate in the study.*" Only students who ticked the checkbox could continue with the questionnaire. Of the 2,438 students who started the questionnaire, 2,229 students signed the statement of approval (91.4%). Finally, the debriefing of the study included information about the study and some web links where students can seek help. In addition, the debriefing included a request for participants to participate in a future (interview) study to follow-up on the questionnaire, although data of the present study will not be linked to this future interview study.

As the response rate lagged significantly after the first invitation e-mail, several measures have been taken to promote the response. In consultation with Academic Services, it was decided to draw a prize, namely two iPads worth €500. Attention was also drawn via Tilburg University's communication channels: a message was posted on the student portal under 'selected for you' and an item about the

monitor was posted on the Tilburg University website. Moreover, three reminder e-mails were sent with a one-week interval.

Ethical considerations

The current study has been approved by the Ethics Review Board (ERB) of the School of Social and Behavioral Sciences of Tilburg University (RP258.). All students were presented with an information letter at the start of the questionnaire, followed by an informed consent with a checkbox that had to be ticked in order to continue the questionnaire. Among other things, students were informed that they could stop their participation in the study at any time. Privacy of participants is guaranteed by treating the research data confidentially and keeping it only in the possession of the research team.

Materials

An online questionnaire was used to answer the research questions. The questionnaire consisted of various topics and was largely based on the student wellbeing monitor DrieMS. This monitor will be introduced in 2021 in the universities and universities of applied sciences in the Netherlands, including Tilburg University (DrieMS, in progress). Below we describe the different items and/or scales that were used, indicated per questionnaire topic. We often asked students how their experiences had changed before and after the COVID-19-outbreak. The period before the COVID-19-outbreak refers to the period before mid-March 2020, whereas the period after the COVID-19-outbreak refers to the period from mid-March 2020 until the time of participation in the questionnaire. The questionnaire can be found in Appendix A.

1. Living situation

The living situation of students was studied through questions about their home situation and working hours per week next to studies, both before and after the COVID-19-outbreak. Questions regarding home situation were based on the DrieMs questionnaire (DrieMs, in progress). Working hours per week next to studies were asked using self-developed items.

2. Physical wellbeing

Physical wellbeing of students was studied through the self-developed question: "*In general, how is/was your physical health?".* This question was asked for two different time moments: at the time of participating and retrospective on the period before the COVID-19-outbreak. Students rated their answers on 5-point scale, ranging from 1 (very bad) to 5 (very good).

3. Mental wellbeing

The mental wellbeing was studied, using validated questionnaires and some self-developed items.

3.1. Life satisfaction

Using the so-called Cantril ladder, students were asked how they experience their life (Cantril, 1965). The ladder was ranged from 0 (worst life I can imagine) to 10 (best life I can imagine).

3.2. Performance pressure

Two items from the DrieMs questionnaire were used to study the frequency that students experienced performance pressure, distinguishing between performance pressure to meet own expectations and to meet expectations of others (DrieMs, 2020). Students rated their experienced pressure to perform on a 4-point scale, ranging from 1 (not at all) to 4 (often). Students were also asked if they experienced a

change in feelings of performance pressure compared to the period before the COVID-19 outbreak. Students rated their answer on a 7-point scale from 1 (became much more) to 7 (became much less).

3.3. Resilience

Using the Brief Resilience Scale (BRS; Smith et al., 2008), the resilience of students was studied. Students rated their answers on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Scores of the respondents were recoded into three categories: low resilience (score 1.00-2.99), normal resilience (score 3.00-4.30), and high resilience (4.31-5.00).

3.4. Sleep problems

Sleeping problems of students were studied through the question: "*To what extent do/did you have trouble sleeping?".* This question was asked for two different time moments: at the time of participating and retrospective on the period before the COVID-19-outbreak. Students rated their answers on a 5-point scale, ranging from 1 (barely to none) to 5 (very much). These items were based on the DrieMs questionnaire (DrieMs, in progress).

3.5. (Sources of) stress

Sources of stress among students were studied through the question: "*To what extent have you experienced stress due to the COVID-19 outbreak regarding...?"* Various potential sources of stress were presented, for example stress about *their studies, their wellbeing, and their loved ones.* Students rated their answers on a 5-point scale, ranging from 1 (barely to none) to 5 (very much). These items were based on the DrieMs questionnaire (DrieMs, 2020).

3.6. Study-related exhaustion

Study-related exhaustion in relation to their study was measured using the 'exhaustion' subscale of the Maslach Burnout Inventory-Student Survey (MBI-SS) (Schaufeli, Martínez et al., 2002). Different from the validated 7-point scale, students scored the five items on a 6-point scale, ranging from 1 (never) to 6 (several times a week or every day). Students were asked if possible psychological complaints in relation to their studies had changed compared to the period before the COVID-19 outbreak. Students rated their answer on a self-designed 7-point scale from 1 (became much more) to 7 (became much less).

3.9. Mental health

Using the Mental Health Inventory 5 (MHI-5), mental health was measured using five items (Berwick et al., 1991). Students rated their mental health on a 6-point scale, ranging from 1 (all of the time) to 6 (none of the time). For the analysis, a value of 0 to 5 is assigned to each answer category. The sum score is then calculated for each respondent, after which it is multiplied by 4. The minimum sum score is 0 and the maximum score is 100. Scores were transformed into four categories: psychologically healthy (score 61-00), psychologically slightly unhealthy (score 45-60), psychologically moderately unhealthy (score 33-44), and psychologically seriously unhealthy (score 0-32) (Driessen, 2011). Students were also asked if their mental health has changed compared to the period before the COVID-19 outbreak. Students rated their answer on a self-designed 7-point scale from 1 (became much worse) to 7 (improved a lot).

3.10. Suicidal thoughts

Suicidal thoughts were measured through the question: "*In the past 4 weeks, how often did you wish you were dead or went to sleep and never wake up again?".* Students rated their answer on a 5-point

scale, ranging from 1 ((almost) always) to 5 (never).[1] This item was based on the DrieMs questionnaire (DrieMs, 2020). Students were also asked if the frequency of suicidal thoughts had changed compared to the period before the COVID-19 outbreak. Students rated their answer on a self-designed 7-point scale from 1 (became much more) to 7 (became much less).

3.11. Loneliness

Using the shortened De Jong Gierveld loneliness scale (De Jong Gierveld & Van Tilburg, 2006, 2008), the extent to which students felt lonely was measured using five items. Students rated their loneliness on a 7-point scale, ranging from 1 (became much more) to 7 (became much less). Conforming to the creators of the scale, scores of the respondents were recoded into three categories: no loneliness (score 0-1), moderately lonely (score 2-4), and seriously lonely (score 5-6) (De Jong Gierveld & Van Tilburg, 2006). Students were also asked if they drank more or fewer alcohol beverages compared to the period before the COVID-19-outbreak. Students rated their answer on a self-designed 7-point scale from 1 (much less) to 7 (much more).

3.11. Substance use

Alcohol use

First, frequency and amount of alcohol use of students was measured using various items, based on the Leefstijlmonitor (Wingen & Boumans, 2017). A weekly consumption average was constructed by recoding answers into actual amounts of consumption and days and eventually by adding up the average number of drinks during the week and the number of drinks at the weekend. We analyzed the alcohol use of students using four approaches: abstainers versus drinkers, acceptable drinking versus non-acceptable drinking, moderate versus non-moderate drinking, and non-problematic versus problematic drinking. Non-acceptable drinking was defined as drinking more than 7 glasses per week. This is based on Dutch Health Council guideliness. Non-moderate drinking was defined as drinking more than 14 glasses per week for women and 21 glasses per week for men (Laar et al., 2019). Finally, problematic drinking was defined as having an AUDIT-C score of ≥ 8 for men, ≥ 7 for women and other (Verhoog et al., 2019). The AUDIT-C score was constructed by recoding questions to match the AUDIT-C format. The AUDIT-C (AUDIT consumption questions, 3 items) is based on the AUDIT (10 items) and appears to be a practical, valid primary care screening test for heavy drinking and/or active alcohol abuse or dependence (Bush et al., 1998).

Other substances

Second, the use of other substances was measured by combining items of the DrieMs questionnaire and Shortened Trimbos Monitor (DrieMs, 2020; Verkorte Trimbos Monitor, 2020). Students were asked whether they had ever used certain substances. For the check substances, students where asked in what way their substance use have changed compared to the period before the COVID-19-outbreak. Students rated their answer on a scale with five categories.

4. Connectedness

The extent to which students felt connected with their university and fellow students was studied by asking whether students felt connected to them. Students rated both statements on a 6-point scale,

[1] Students who reported that they usually or (almost) always have suicidal thoughts and/or that these thoughts had become (much) more were presented with a helpline was shown *("You can always contact suicide prevention if you have thoughts of death (0900 -0113), 113.nl"*).

ranging from 1 (strongly disagree) to 5 (strongly agree) and 6 (not applicable). Students were also asked if the feelings of connectedness had changed compared to the period before the COVID-19 outbreak. Students rated their answer on a self-developed 8-point scale from 1 (became much more) to 7 (became much less) and 8 (not applicable).

5. (Social) support

The amount of (social) support that students experienced was studied by asking whether through the question if students felt supported by their family, friends, partner, roommates, fellow students, lecturers, the university's student counselors, fellow students and the university. Students rated all items on a 6-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree) and 6 (not applicable). These items were partly based on the DrieMs questionnaire (DrieMs, 2020). Students were also asked if the feelings of support had changed compared to the period before the COVID-19 outbreak. Students rated their answer on a self-designed 8-point scale from 1 (became much more) to 7 (became much less) and 8 (not applicable).

Using self-developed items, students were asked in what areas they (had) needed support from the university after the COVID-19-outbreak. Students were presented with checkboxes for nine areas, an 'otherwise, namely'-option and the option to report they did not need any support. Multiple answers were possible for this question. Next, students were asked whether they were able to find this support for the areas they needed using check-boxes.

To further find out where students would look for support from the university, the self-developed question was used: *"If you were looking for help from the university, where would you look for it?".* Students were presented with checkboxes for eight areas, but were able to suggest other areas.

6. Distance education

Online education

To get an indication of how students have experienced the various parts of online education in the period after the COVID-19-outbreak, they were asked to rate their experiences of online lectures, online workgroups/practicals, individual coaching, and online assessment. Students rated their answers on a 7-point scale from 1 (very negative) to 7 (very positive) and 8 (not applicable).

Students were presented with the question: *"In what way do you think your study success has been influenced by the other form of assessment?".* Students rated their answers on a 7-point scale from 1 (very negative) to 7 (very positive) and 8 (not applicable). To study if students thought they suffered from a study delay because of the COVID-19-outbreak, student were presented with the question: *"To what extent do you think you suffered a study delay due to the COVID-19 outbreak?".* Students answered this question on 6-point scale, ranging from 1 (not) to 6 (more than one academic year).

Studying from home

To study the experiences from studying from home, the following question was asked to the students: *"Do you encounter problems studying from home in the period after the COVID-19 outbreak? If so, in which areas?".* Students were presented with checkboxes for eight areas and multiple answers were possible. These items were partly based on a questionnaire designed by Missler et al. (2020). In addition, an open-ended question gave students the possibility to report other problems they may have encountered. Furthermore, based on the questionnaire of Missler et al. (2020), students were asked what action they took to solve these problems, again by being presented with checkboxes for nine areas

and an ‘otherwise, namely’-option. Moreover, based on self-developed categories, students were asked whether they experience any positive aspects to studying from home. Students were given four possible positive aspects, an ‘otherwise, namely’-option, and the option to report they did not experience any positive aspects.

Finally, using a self-developed question, students were asked what form of education they prefer when the COVID-19-period is over. Students could choose from four possible answers: ‘especially on campus’, ‘especially online’, ‘combination of online and on-campus education’, and ‘otherwise, namely’.

Analysis

We used the software program SPSS (version 24) to analyze the data. Some items of certain scales had to be reversed, because the scale consisted of a mix of positive and negative questions asked.

Reliability analyses

Reliability analyses were performed using Cronbach's alpha to determine whether the items that measured resilience (BRS) and study-related exhaustion (MHI-SS) could be combined and form scales. First, the six items of the resilience scale showed an internal consistency of *Cronbach's α* = .84, implying a good internal consistency. Second, the five items of the MHI-SS scale showed an internal consistency of *Cronbach's α* = .90, implying an excellent internal consistency. All in all, there was sufficient reason to merge the items of above described scales. Questions were aggregated in scales using the SPSS function compute variable, whereby the mean scores per scale were calculated.

Analytic plan

Descriptive statistics have been used to map frequencies, means, and standard deviations of all demographic characteristics, but also all other answers. Various test statistics were used to analyze the data and determine whether there were any statistically significant differences between the dependent variables (e.g. loneliness, experienced support, distance education evaluation) and three factors. That is, data was broken down into 1) whether or not being an international student, 2) different study phases (groups for different study phases were the Bachelor’s 1, Bachelor’s 2/3, and Master’s phase), and 3) when relevant data were broken down by School.

For most continuous dependent variables, the breakdowns were conducted using one-way ANOVA’s. MANOVA’s were used to analyze bundles of items relating to the same subject, including items from experienced stress from various causes, performance pressure, experienced social support from various sources, evaluations of digital education, and problems with studying from home. For all categorical dependent variables, these breakdowns were conducted using Chi-square Tests of Independence by using contingency tables. Finally, Repeated Measures ANOVA’s were used to study changes in physical wellbeing, life satisfaction, and sleeping problems before and after the COVID-19-outbreak.

Not all dependent variables were broken down to all three factors. This was only the case for the dependent variables related to connectedness, support, experiences with distance education, and some specific elements of studying from home (which actions students took to solve problem, which positive aspects students experienced, and which education form they preferred). Some dependent variables were only broken down to the first two factors: international versus national students and different study phases. This was the case for all dependent variables related to physical and mental wellbeing (including substance use) and for some elements of studying from home. Finally, dependent variables related to living situation were only broken down to whether or not being an international student. In all

reported tables, significant differences between these group-breakdowns were indicated using superscripts. More specifically, the superscript(s) reported below a certain group indicated from what other group(s) it significantly differed.

Results

Background information

In total, 16,657 students were invited by email. Of those invited, 2,438 started the questionnaire, 2,229 signed informed consent, and 1,873 finished the questionnaire completely. This represents a response rate of 13.4% for informed consent signers and 11.2% for complete finishers. 64.0% of the participants (i.e. those who signed informed consent) indicated Dutch as their preferred language for the questionnaire. Participant characteristics can be found in Table 1. Almost half of the students (47.9%) had a partner. The majority of students that had a partner (65.1%) did not live with their partner. The largest group of students lived in the Netherlands before they started their studies (67.7%). Other frequently reported countries were Germany (5.7%), Italy (2.2%), Bulgaria (1.7%), China (1.5%), and Turkey (1.5%). An overview of all other reported countries and of the countries where family members live with whom students had the most contact is given in Appendix C.

Table 1. Sample characteristics (N = 2229)

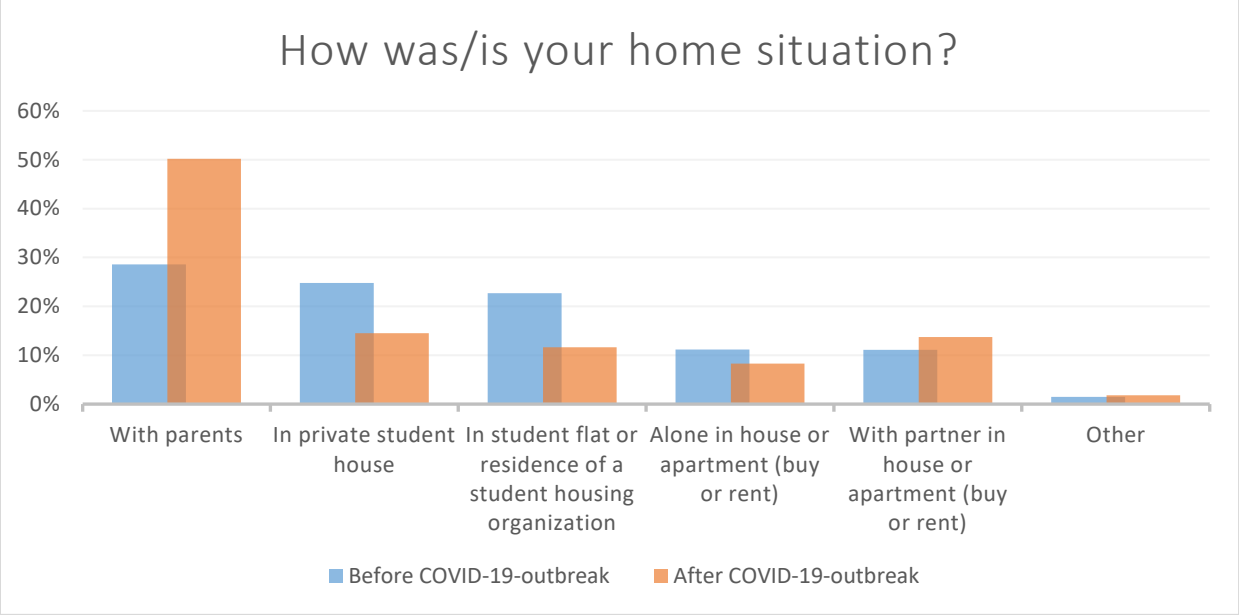
Variable	***n* (%)**
Gender	
Male	758 (34.2%)
Female	1444 (65.2%)
Other	14 (0.7%)
Age (*M*, *SD*)	23.10, 4.72
Study phase	
Bachelor 1	149 (6.9%)
Bachelor 2/3	1027 (47.3%)
Master (1-year, 2-year, pre-, extended)	997 (45.9%)
School	
TiSEM	711 (33.4%)
TLS	381 (17.9%)
TSB	604 (28.4%)
TSHD	400 (18.8%)
TST	28 (1.3%)
Other	6 (0.3%)
Type of student	
National	1476 (67.2%)
International	719 (32.8%)

1. Living situation

1.1. Home situation

Students reported where they lived before and after the COVID-19-outbreak. Before the outbreak, 28.6% of the students lived with their parents, 24.8% in a private student house, and 22.7% in a student flat or residence of a student home organization. After the outbreak, these percentages were 50.2%, 14.5%, and 11.6% respectively (Figure 1.1).

Figure 1.1. Home situation of students before and after the COVID-19-outbreak in percentages (n = 2109)



Additional analyses showed significant associations between the home situation both before and after the COVID-19-outbreak and whether or not being an international student. Not surprisingly, both before and after the COVID-19-oubreak, national students seem **more** likely than international students to live with their parents. In addition, international students seem **more** likely than national students to live in a student flat or residence of a student housing organization, both before and after the COVID-19-outbreak. Finally, we found that before the COVID-19-outbreak, international students seem **more** likely than national students to live alone in a house or apartment. This difference disappeared after the COVID-19-outbreak (Table 1.1).

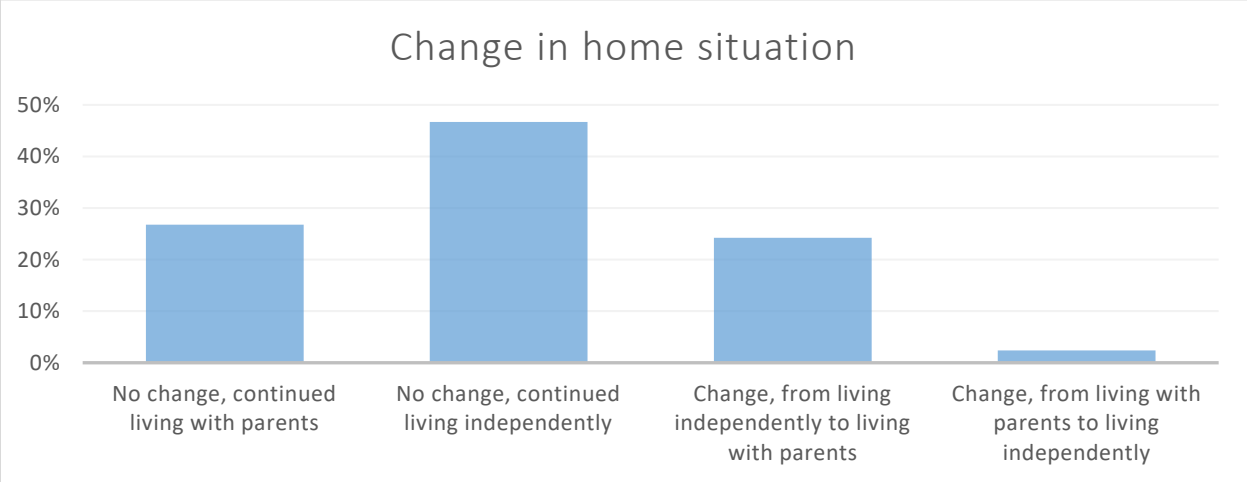
Table 1.1 Chi-square test results on home situation before and after the COVID-19-outbreak, broken down to national versus international students (n = 2109)

	Home situation												
	With parents		In private student house		In student flat or residence of student housing organization		Alone in house or apartment (buy or rent)		With partner in house or partner (buy or rent)		Other		
Time	National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	χ-test
Before COVID-19	40.5% [b]	3.7% [a]	24.9%	24.8%	13.7% [b]	41.6% [a]	8.6% [b]	16.6% [a]	11.1%	11.3%	1.3%	2.1%	405.49 ***
After COVID-19	54.3% [b]	41.6% [a]	14.2%	15.0%	8.8% [b]	17.6% [a]	7.6%	9.7%	13.4%	14.2%	1.8%	1.9%	48.93 ***

*** $p < .001$. Note. Df (5).

During the COVID-19-period, a quarter of the students (24.2%) moved back to live with their parents, whereas almost half of the students (46.7%) did not move and continued living independently. More than a quarter of the students (26.8%) did not move and continued living with their parents, whereas a small proportion of the student (2.4%) moved from their parents to living independently (Figure 1.2).

Figure 1.2. Change in home situation of students during the COVID-19-period in percentages (n = 2060)



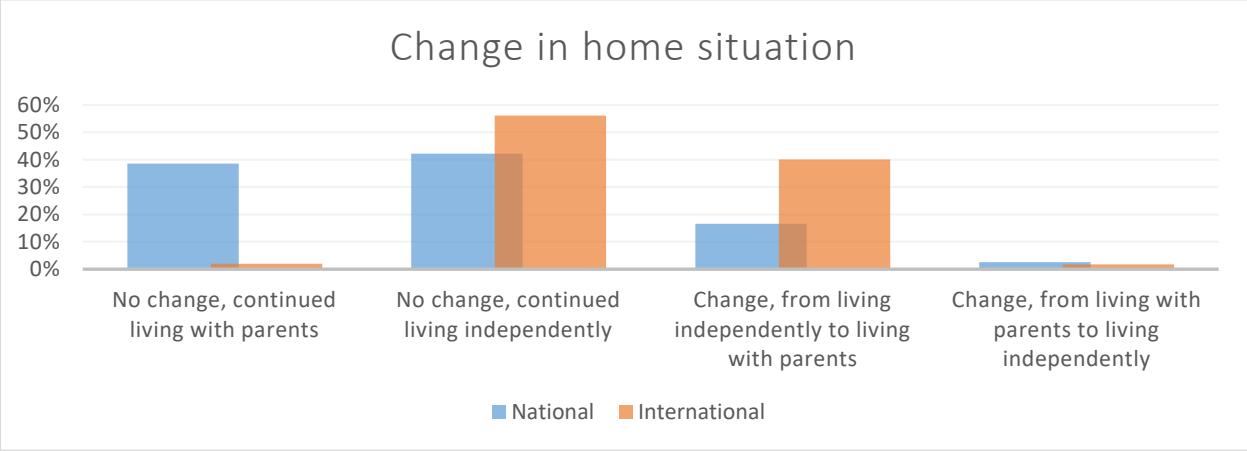
Additional analyses showed a significant association between changes in home situation during the COVID-19-period and whether or not being an international student. International students seem **more** likely than national students to have changed their home situation from living independently to living with their parents. In addition, national students seem **more** likely than international students to have not changed home situation by continuing living with their parents. Finally, international students seem **more** likely than national students to have not changed home situation by continuing living independently (Table 1.2, Figure 1.3).

Table 1.2. Chi-square test results on change in home situation during the COVID-19-period, broken down to national versus international students (n = 2060)

Change in home situation								
No change, continued living with parents		No change, continued living independently		Change, from living independently to living with parents		Change, from living with parents to living independently		
National (a)	Inter-national (b)	National (a)	Inter-national (b)	National (a)	Inter-national (b)	National (a)	Inter-national (b)	χ-test
38.6% [b]	2.0% [a]	42.2% [b]	56.1% [a]	16.6% [b]	40.1% [a]	2.6%	1.8%	347.94 ***

*** $p < .001$. Note. Df (3).

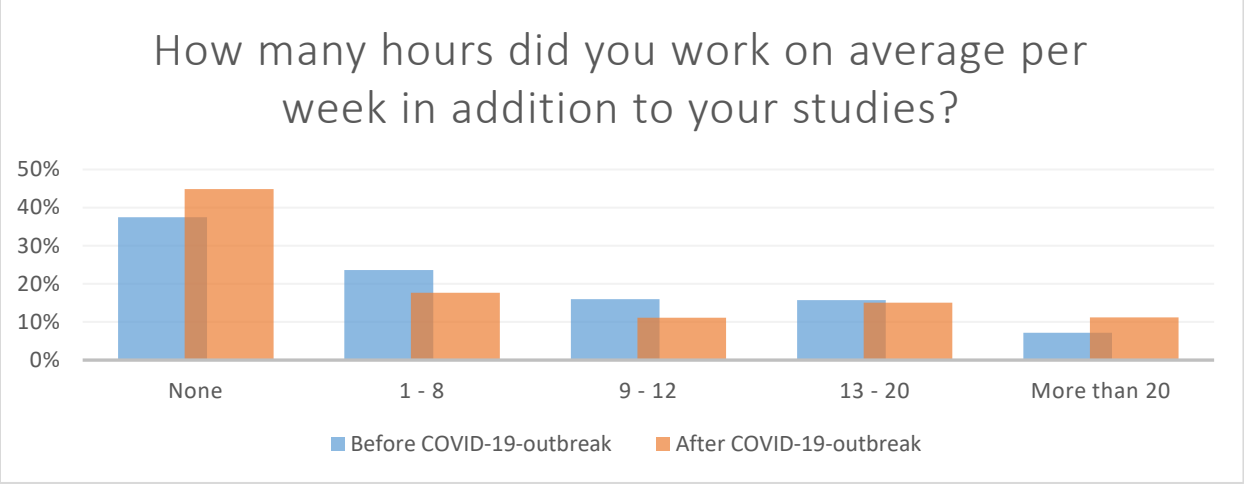
Figure 1.3. Change in home situation of students during the COVID-19-period in percentages (n = 2060)



1.2. Working hours

Before the outbreak, 37.5% of the students did not work in addition to their studies. 23.5% of the students worked 1-8 hours per week, 16% worked 9-12 hours per week, 15.7% worked 13-20 hours per week and a small percentage (7.2%) worked more than 20 hours per week. After the outbreak, these percentages were 44.9%, 17.8%, 11.1%, 17.6%, and 11.2% respectively (Figure 1.4).

Figure 1.4. Working hours per week before and after the COVID-19-outbreak in percentages (n = 2100)



Additional analyses showed significant associations between the home situation both before and after the COVID-19-outbreak and whether or not being an international student. International students seem **more** likely than national students to not work, both before and after the COVID-19-outbreak. National students seem to be **more** likely than international students to work in addition to their studies (before COVID-19-outbreak = 1-12 hours; after COVID19-outbreak = 1-20 hours) (Table 1.3).

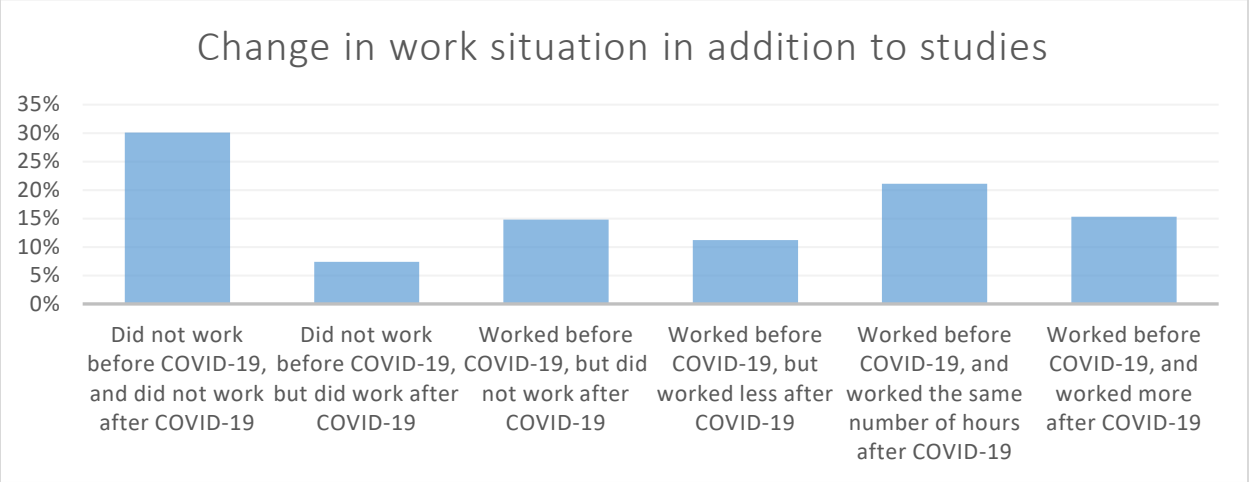
Table 1.3. Chi-square test results on working hours before and after the COVID-19-outbreak, broken down to national versus international students (n = 1904)

	Working hours										
	None		1 - 8		9- 12		13 - 20		More than 20		
Time	National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	χ-test
Before COVID-19	27.4% b	58.6% a	28.4% b	13.4% a	20.5% b	6.6% a	16.3%	14.4%	7.4%	6.9%	219.20 ***
After COVID-19	38.8% b	57.4% a	19.5% b	14.1% a	12.5% b	8.4% a	17.7% b	9.4% a	11.5%	10.6%	71.01 ***

**p < .05, **p < .01, *** p < .001. Note. Df (4).*

During the COVID-19-period, 26.0% had work before but started working fewer hours, 21.1% had work and continued to work the same number of hours, and 15.3% had work and started working more hours per week. 14.8% worked before the COVID-19-outbreak but did not work anymore at the time of participating (Figure 1.4).

Figure 1.4. Change in work situation during the COVID-19-period (before versus after COVID-19-outbreak) in percentages (n = 2100)



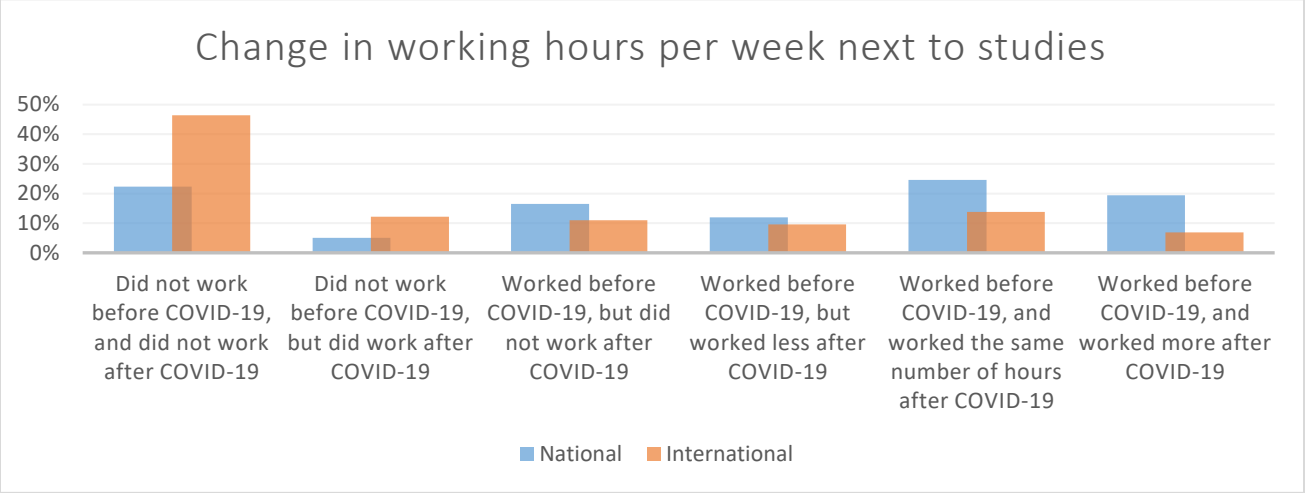
Additional analyses showed a significant association between changes in working hours per week next to studies during the COVID-19-period and whether or not being an international student, χ^2 (2) = 32.80, p < .001. National students seem **more** likely than international students to have worked before but not have work after the COVID-19-outbreak, to have worked before and worked the same hours after the COVID-19-outbreak, and to have worked before and worked more hours after the COVID-19-outbreak. International students seem **more** likely than national students to not have worked before and after the COVID-19-outbreak and to have not worked before but did have work after the COVID-19-outbreak (Table 1.4, Figure 1.5).

Table 1.4 Chi-square test results on change in work situation during the COVID-19-period, broken down to national versus international students (n = 2100)

Change in work situation												
Did not work before and did not work after		Did not work before but did work after		Worked before but did not work after		Worked before but worked less after		Worked before and worked the same after		Worked before and worked more after		
National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	χ-test
22.3% b	46.4% a	5.1% b	12.2% a	16.5% b	11.0% a	12.0%	9.6%	24.6% b	13.8% a	19.4% b	6.9% a	203.06 ***

**** p < .001. Note. Df (5).*

Figure 1.5. Change in working hours per week during the COVID-19-period (before versus after COVID-19-outbreak) in percentages, broken down to national versus international students (n = 2100)



Key points living situation

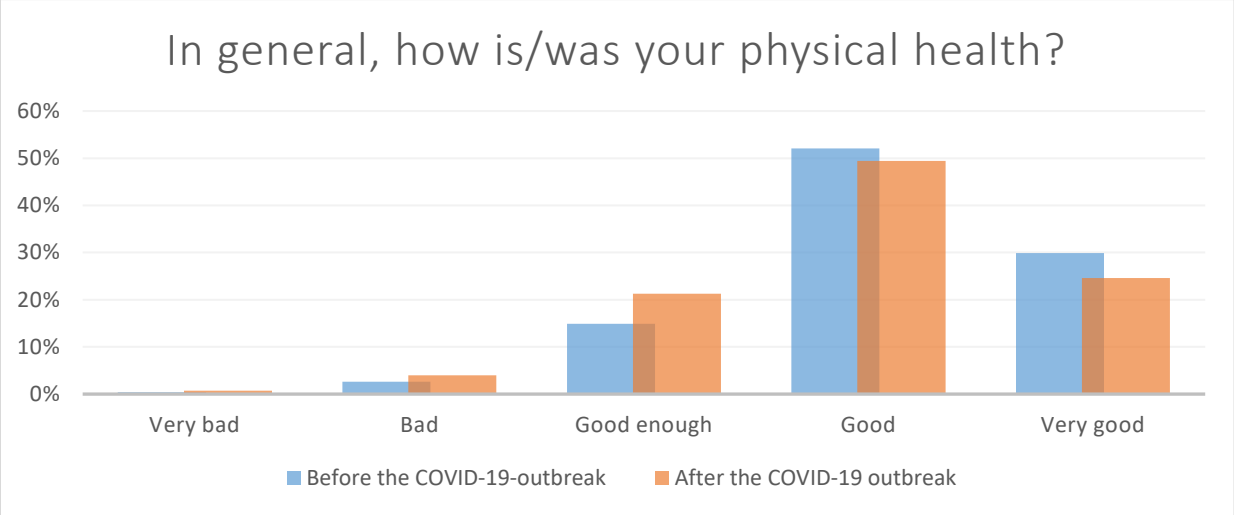
- Before the outbreak, 40.5% of the national students and 3.7% of the international students lived with their parents. After the COVID-19-outbreak, these percentages increased to 54.3% and 41.6% respectively. During the COVID-19-period, almost a quarter of the students (24.2%) moved back to live with their parents, whereas almost half of the students (46.7%) did not move and continued living independently. International students seem more likely than national students to have moved from living independently to living with their parents during the COVID-19-period, although relatively speaking international students remain more likely than national students to live independently.

- National students seem more likely than international students to work in addition to their studies, both before and after the COVID-19-outbreak. There was mainly an increase in non-workers among national students before and after the outbreak (27.4% to 38.3%), as international students remained relatively stable (58.6% to 57.4%). 14.8% of the students had work before but did not work anymore after the COVID-19-outbreak, 26.0% started working fewer hours and 21.1% had no change in working hours.

2. Physical wellbeing

At the time of participating, the majority of the students (74.0%) reported to have a (very) good physical wellbeing. When looking back on the period before the COVID-19-outbreak, the majority of the students (82.0%) reported to have a (very) good physical wellbeing before the COVID-19-outbreak (Figure 2.1). We found a significant effect of time on physical wellbeing, *Wilks' Lambda* = .956, *F* (1, 2097) = 96.09, $p < .001$. On average, results showed that the physical wellbeing of students was significantly better before the COVID-19-outbreak (*M* = 4.08, *SD* = 4.08) than after the COVID-19-outbreak, at the time of participation (*M* = 3.93, *SD* = .82), *F* (1, 2097) = 96.09, $p < .001$. These scores represent a 'good' physical wellbeing.

Figure 2.1. Physical wellbeing before and after the COVID-19-outbreak in percentages (n = 2098)



Additional analyses showed no significant effect of whether or not being an international student on physical wellbeing, *Wilks' Lambda* = .999, *F* (1, 2096) = 2.39, $p > .05$. In addition, we found no significant effect of study phases on physical wellbeing, *Wilks' Lambda* = 1.000, *F* (2, 2077) = .14, $p > .05$.

Disabilities, disorders, or diseases

We also studied potential disabilities, disorders, or diseases of students. The majority of students (67.6%) reported that they had no disorders or illnesses. Among the students who did report having a disability, disease or disorder, the largest group reported a psychological disorder (36.4%), followed by a chronic disorder or illness (29.7%) (Figure 2.2). For each condition that was reported, student were asked whether they were affected more or less by their condition in daily life than in the period before the COVID-19-outbreak. For the majority of reported disabilities, diseases, or disorders, students reported to be more affected by their condition than before the COVID-19-outbreak. For example, for mental disorders (69.1%), ADHD, ADD or concentration problems (60.7%), and autism (56.1%), the largest group indicated to be more affected by their condition than before the COVID-19-outbreak. For sensory impairments (72.7%), dyslexia or dyscalculia (71.4%), chronic affliction/disease (49.5%), mobility restriction (45.8%), the largest group reported no change in being affected (Figure 2.3).

Figure 2.2. Reported disabilities, disorders, or diseases among students who reported having this, in percentages of "yes"-answers (n = 679)

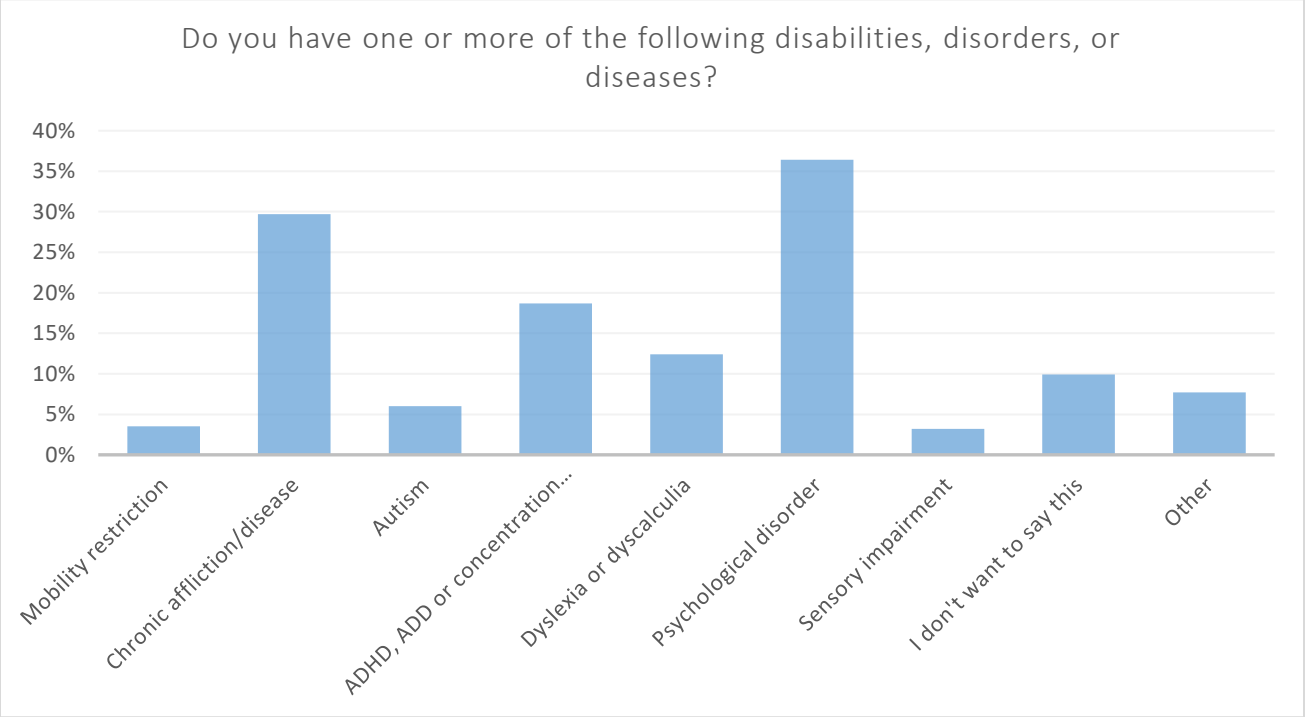
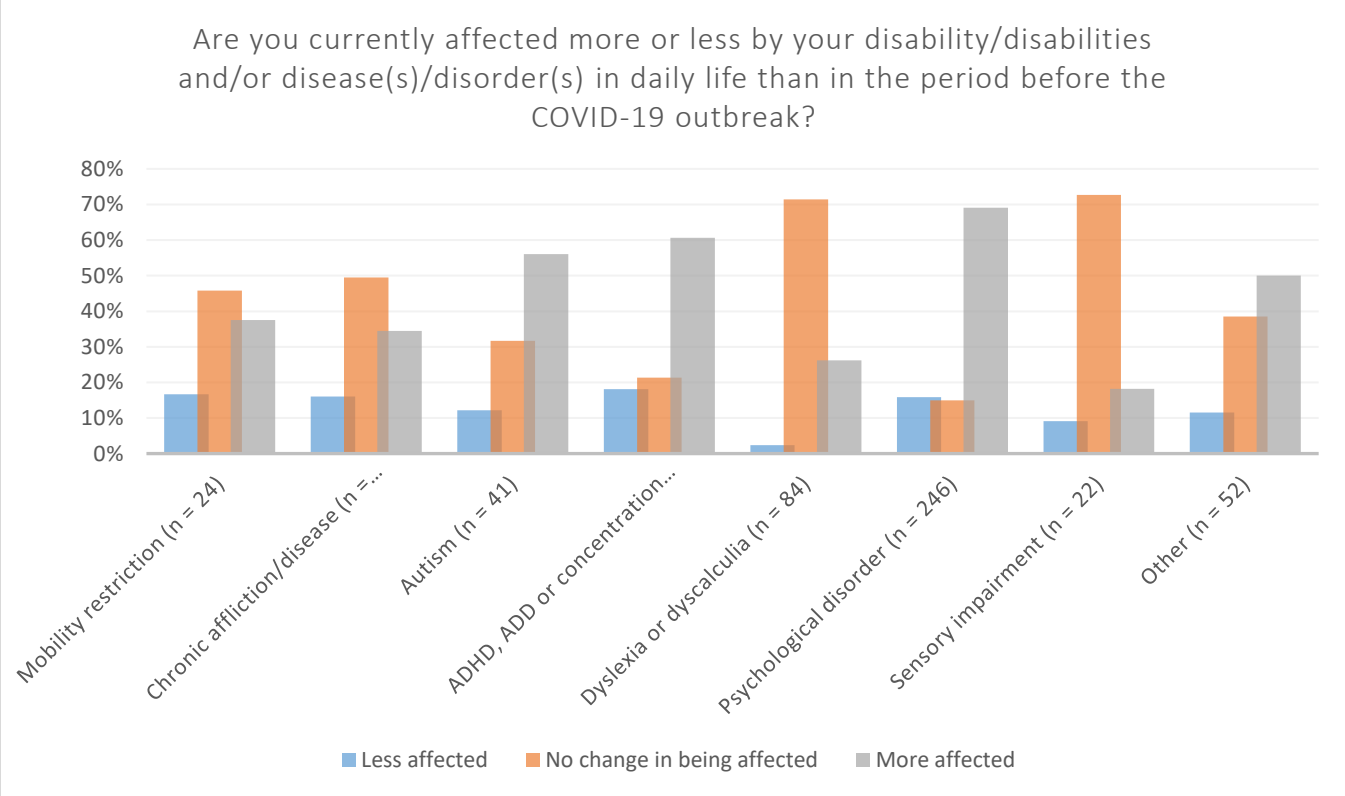


Figure 2.3. Changes in being affected by disability, disease, or disorder during the COVID-19-period in percentages



Key points physical wellbeing

- The physical wellbeing of students was negatively affected by the COVID-19-outbreak, although remaining between ‘good enough’ and ‘good’.
- Compared to the period before the COVID-19-outbreak, especially students that have mental disabilities, diseases, or disorders (e.g. psychological disorders, ADHD, ADD, or concentration problems, autism) seem to be more affected by their condition than students that have non-mental conditions.

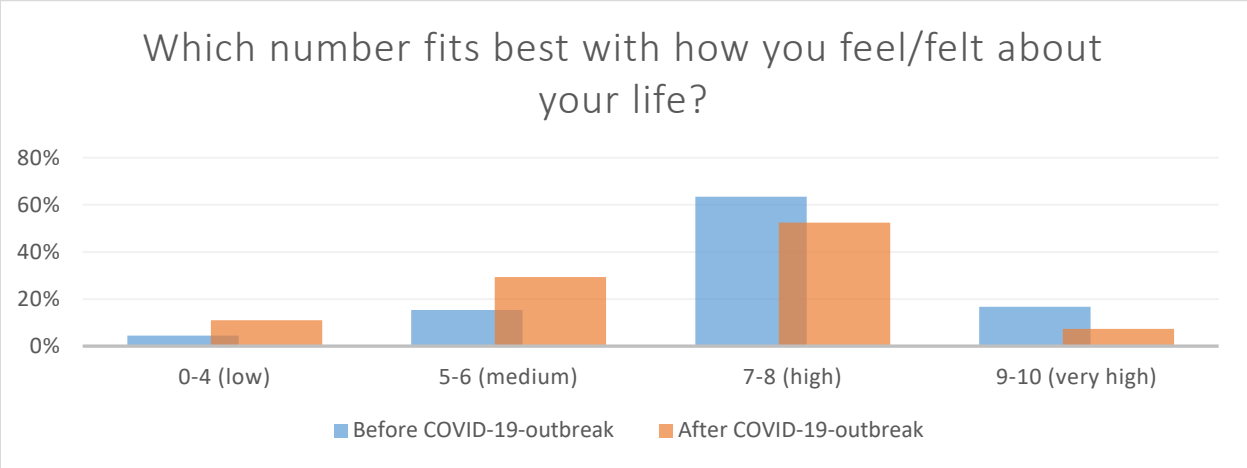
3. Mental wellbeing

3.1. Life satisfaction

At the time of participating, the largest group of students (52.4%) scored high (grade 7-8) on life satisfaction. When reporting life satisfaction in a retrospective manner on the period before the COVID-19-outbreak, 63.4% scored high on life satisfaction (Figure 3.1). There was a statistically significant difference of time on life satisfaction, *Wilks' Lambda* = .838, *F* (1, 2078) = 402.49, *p* < .001. On average, analyses showed that reported student life satisfaction was significantly better before the COVID-19-outbreak (*M* = 7.38, *SD* = 1.41) than at the time of participation (*M* = 6.58, *SD* = 1.63), *F* (1, 2078) = 402.49, *p* < .001.

Additional analyses showed no significant effect of whether or not being an international student on life satisfaction, *Wilks' Lambda* = 1.000, *F* (1, 2077) = .10, *p* > .05. In addition, we found no significant effect of study phases on life satisfaction, *Wilks' Lambda* = 1.000, *F* (2, 2059) = .40, *p* > .05.

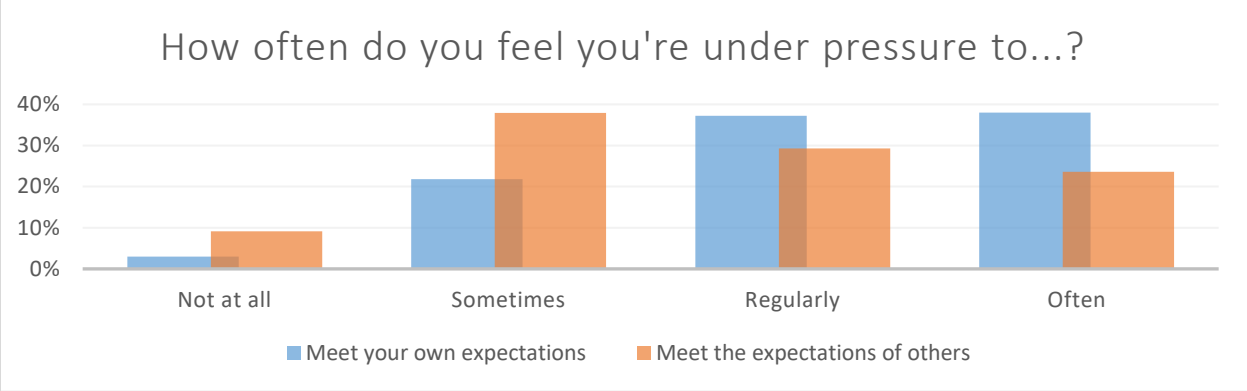
Figure 3.1.1. Life satisfaction before and after the COVID-19-outbreak in percentages (n = 2079)



3.2. Performance pressure

Regarding performance pressure due to own expectations, the largest group of students (38.0%) reported to often experience this, followed by regularly (37.2%). Regarding performance pressure due to expectations of others, the largest group (37.9%), followed by regularly (29.3%) (Figure 3.2). On average, students reported to experience performance pressure due to their own expectations regularly to often (*M* = 3.10, *SD* = .84). In addition, they reported to experience performance pressure due to expectations of others sometimes to regularly (*M* = 2.67, *SD* = .84).

Figure 3.2. Performance pressure due to own expectations and expectations of others in percentages (n = 2072)



Additional analyses showed there were some statistically significant differences in performance pressure between international and national students, *Wilks' Lambda* = .994, *F* (2, 2069) = 6.37, *p* < .01. We found that international students experience performance pressure due to their own expectations more often than national students, where scores represented performance pressure between 'regularly' and 'often' (Table 3.1). Furthermore, we found no significant differences between different study phases and experienced performance pressure, *Wilks' Lambda* = .540, *F* (4, 4102) = .54, *p* > .05.

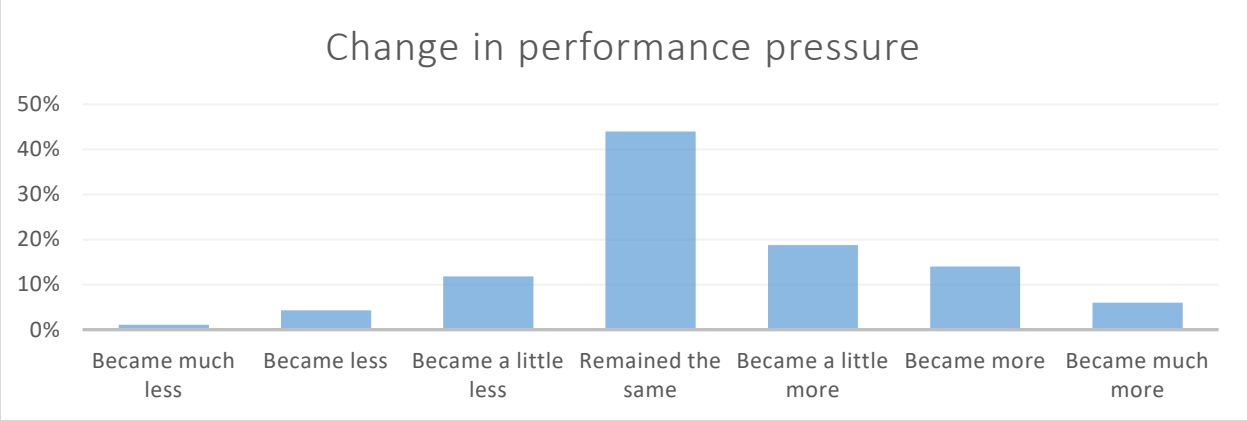
Table 3.1. MANOVA test results on performance pressure, broken down to national versus international students (n = 2072)

	Group				
	National (a)		International (b)		
Type of performance pressure	*M*	*SD*	*M*	*SD*	*F*-test
Due to own expectations	3.06[b]	.85	3.20[a]	.81	12.65***
Due to expectations of others	2.66	.94	2.71	.94	1.17

**** p < .001. Note. M = Mean, SD = Standard Deviation. Both forms performance pressure were scored on a scale from 1 (not at all) to 4 (often). Df (1, 2070).*

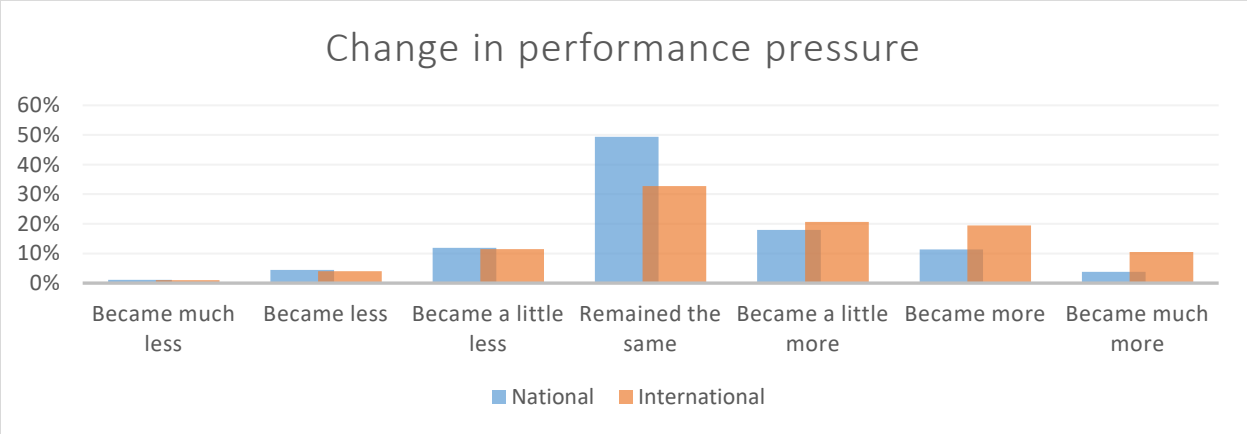
When it comes to changes in this experienced performance pressure compared to the period before the COVID-19 outbreak, the largest group of students (44.8%) reported no change in performance pressure. 18.8% that reported to experience a little more performance pressure, and 14.0% reported to experience more performance pressure (Figure 3.3). On average, students reported a change in performance pressure of 4.41 (*SD* = 1.23), which represents a score between 'remained the same' and 'became a little more'.

Figure 3.3. Change in performance pressure compared to the period before the COVID-19-outbreak in percentages (n = 2060)



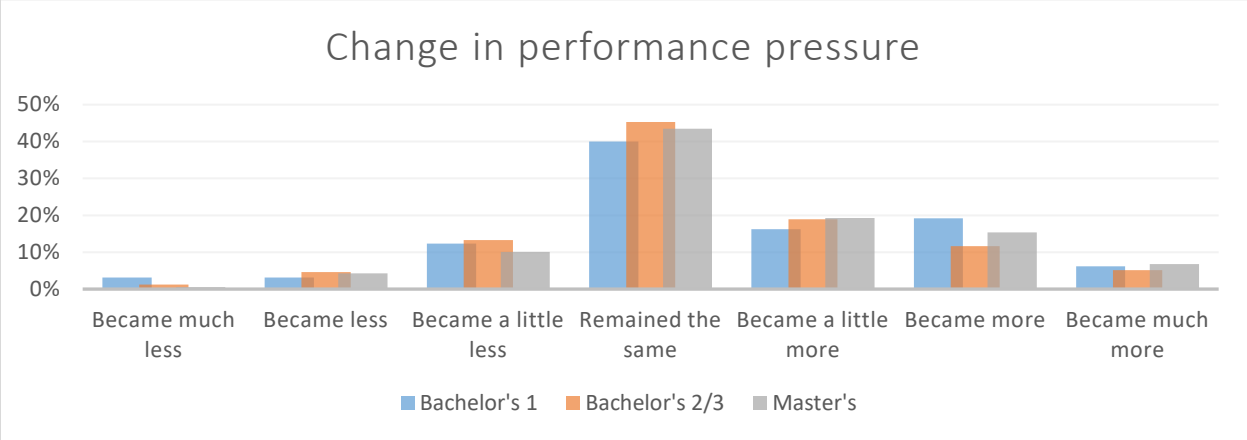
Additional analyses showed that international students experience significantly more 'negative' change (M = 4.68, SD = 1.36) than national students (M = 4.28, SD = 1.14), F (1, 2058) = 49.55, p < .001. In other words, the performance pressure of international students changed more strongly to the negative side than national students. These scores represent a change of between 'remained the same' and 'became a little more (Figure 3.4).

Figure 3.4. Change in performance pressure compared to the period before the COVID-19-outbreak in percentages, broken down to national versus international students (n = 2060)



Additional analyses also showed there was a significant effect of study phase on the change in performance pressure, F (2, 2040) = 5.96, p < .01. The Games-Howell *post hoc* test revealed that students in the Master's phase experience significantly more 'negative' change (M = 4.50, SD = 1.22) than students in the Bachelor's 2/3 phase (M = 4.31, SD = 1.20). These scores represent a change of between 'remained the same' and 'became a little more' (Figure 3.5).

Figure 3.5. Change in performance pressure compared to the period before the COVID-19-outbreak in percentages, broken down to study phase (n = 2043)



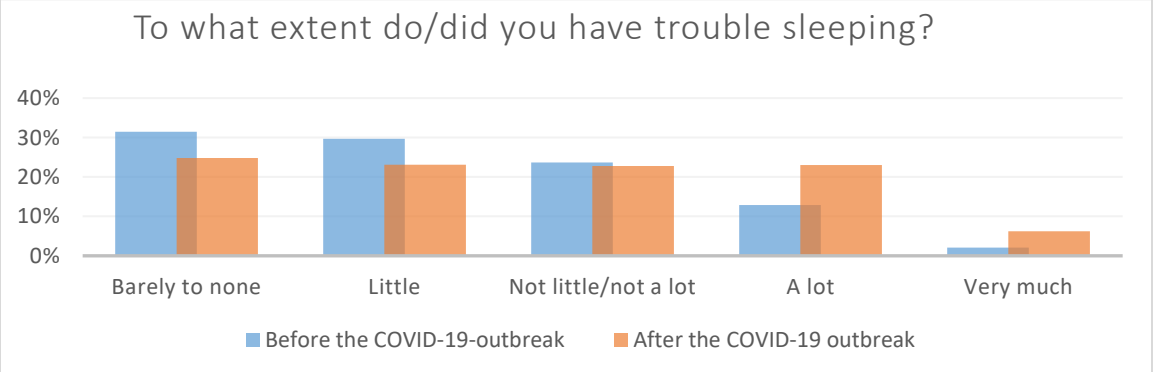
3.3. Resilience

The majority of students (56.9%) had normal resilience, 37.5% had low resilience, and 5.6% had high resilience. Additional analyses showed no significant association between level of resilience and whether or not being an international student, χ^2 (2) = 1.36, $p > .05$, and no significant association between level of resilience and different study phases was found either, χ^2 (4) = 8.16, $p > .05$. Because it looks like resilience is a theme that is difficult to evaluate retrospectively, we didn't measure this for the pre-COVID-19 period.

3.4. Sleeping problems

At the time of participating, the majority of students (75.2%) reported to have some form of sleeping problems. When looking back on the period before the COVID-19-outbreak, this percentage was smaller (68.5%) (Figure 3.6). There was a statistically significant effect of time on sleeping problems, *Wilks' Lambda* = .880, F (1, 2000) = 271.64, $p < .001$. On average, results showed that students had significantly less trouble sleeping before the COVID-19-outbreak (M = 2.24, SD = 1.09) than after the COVID-19-outbreak (M = 2.63, SD = 1.25), F(1, 2000) = 271.64, $p < .001$. These scores represent 'little' to 'not a little/not a lot' sleeping troubles among students in both moments.

Figure 3.6. Sleeping problems before and after the COVID-19-outbreak in percentages (n = 2001)

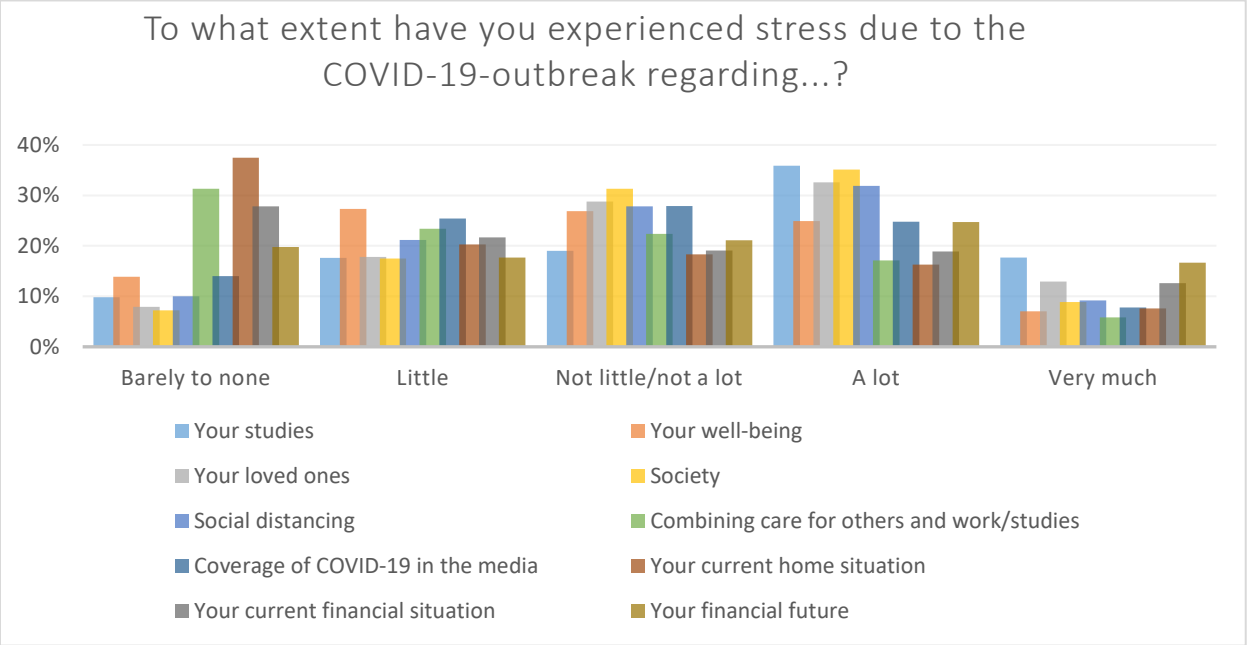


Additional analyses showed no significant effect of whether or not being an international student on sleeping problems, *Wilks' Lambda* = .999, *F* (1, 1999) = 2.23, *p* > .05. In addition, we found no significant effect of study phase on sleeping problems, *Wilks' Lambda* = .999, *F* (1, 1981) = 1.48, *p* > .05.

3.5. Stress sources

Causes of stress due to the COVID-19 outbreak that were reported to be experienced a lot or very much were studies (53.6%), loved ones (45.5%), society (44.0%), financial future (41,4%) and social distancing (41.0%) (Figure 3.6).

Figure 3.6. Experienced stress due to COVID-19-outbreak regarding various causes of stress in percentages (n = 1981)



On average, students reported the highest score of frequency of stress regarding their studies (online education, possible study delay due to COVID-19-outbreak), representing a score between 'not little/not a lot' and 'a lot'. In addition, stress regarding their loved ones, their wellbeing, and social distancing (digital communication, 1.5 meter distance, no physical contact) was rated similarly high (Table 3.2).

Table 3.2. Total scores on experienced stress (n = 1981)

	M	*SD*
Your studies	3.34	1.23
Your wellbeing	2.84	1.15
Your loved ones	3.25	1.13
Society	3.21	1.06
Social distancing	3.09	1.14
Combining care for others and work/studies	2.43	1.25
Coverage of COVID-19 in the media	2.87	1.17
Your current home situation	2.36	1.33
Your current financial situation	2.67	1.38
Your financial future	3.01	1.37

Note. M = Mean, SD = Standard Deviation. All different sources of stress were scored on a scale from 1 (barely to none) to 5 (very much).

Additional analyses showed statistically significant differences in experienced causes of stress due to the COVID-19-outbreak between international and national students, *Wilks' Lambda* = .889, $F(10, 1970) = 24.60$, $p < .001$. International students experienced significantly more stress about almost all measured sources of stress. Only stress about social distancing did not differ significantly between international and national students (Table 3.3).

Table 3.3. MANOVA on experienced stress, broken down to national versus international students (n = 1981)

	Group				
	National (a)		International (b)		
Cause of stress	*M*	*SD*	*M*	*SD*	*F*-test
Your studies	3.24 [b]	1.23	3.54 [a]	1.21	25.41***
Your wellbeing	2.67 [b]	1.10	3.18 [a]	1.19	89.22***
Your loved ones	3.13 [b]	1.08	3.49 [a]	1.19	44.13***
Society	3.15 [b]	1.01	3.33 [a]	1.16	13.09***
Social distancing	3.08	1.09	3.11	1.23	0.39
Combining care for others and work/studies	2.21 [b]	1.17	2.88 [a]	1.30	132.87***
Coverage of COVID-19 in the media	2.75 [b]	1.11	3.11 [a]	1.24	41.98***
Your current home situation	2.15 [b]	1.25	2.80 [a]	1.39	108.61***
Your current financial situation	2.49 [b]	1.32	3.05 [a]	1.43	75.44***
Your financial future	2.82 [b]	1.33	3.39 [a]	1.38	76.84***

*** $p < .001$. *Note. M = Mean, SD = Standard Deviation. All different sources of stress were scored on a scale from 1 (barely to none) to 5 (very much). Df (1, 1981).*

Other additional analyses also showed there was a significant effect of study phase on experienced stress due to the COVID-19-outbreak *Wilks' Lambda* = .962, $F(20, 3904) = 3.84$, $p < .001$. Games-Howell *post hoc* tests revealed that Master's students experience significantly more stress due to the COVID-19-outbreak regarding their loved ones and regarding social distancing than Bachelor's 2/3 students. These scores represent a change of between 'not little/not a lot' and 'a lot'. In addition, Master's students experience significantly more stress due to the COVID-19-outbreak regarding their current financial situation and regarding their financial future than Bachelor's 1 and Bachelor's 2/3 students. These scores represent a change of between 'little' and 'not little/not a lot' (Table 3.4).

Table 3.4. MANOVA on experienced stress, broken down study phase (n = 1964)

	Study phase						
	Bachelor's 1 (a)		Bachelor's 2/3 (b)		Master's (c)		
Cause of stress	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*-test
Your studies	3.42	1.17	3.33	1.23	3.35	1.24	.27
Your wellbeing	2.87	1.15	2.77	1.15	2.89	1.15	2.53
Your loved ones	3.19	1.14	3.17 [c]	1.14	3.33 [b]	1.12	5.20*
Society	3.13	1.08	3.15 [c]	1.10	3.27 [b]	1.08	3.27
Social distancing	3.09	1.18	3.00 [c]	1.17	3.19 [b]	1.09	6.76*
Combining care for others and work/studies	2.34	1.25	2.37	1.23	2.50	1.27	2.62
Coverage of COVID-19 in the media	2.82	1.17	2.82	1.13	2.92	1.2	1.61
Your current home situation	2.42	1.36	2.30	1.32	2.40	1.33	1.45
Your current financial situation	2.46 [c]	1.30	2.58 [c]	1.37	2.78 [a b]	1.39	6.52*
Your financial future	2.73 [c]	1.31	2.82 [c]	1.34	3.23 [a b]	1.38	24.28***

**p < .05, ***p < .001. Note. M = Mean, SD = Standard Deviation. All different sources of stress were scored on a scale from 1 (barely to none) to 5 (very much). Df (1, 1981).*

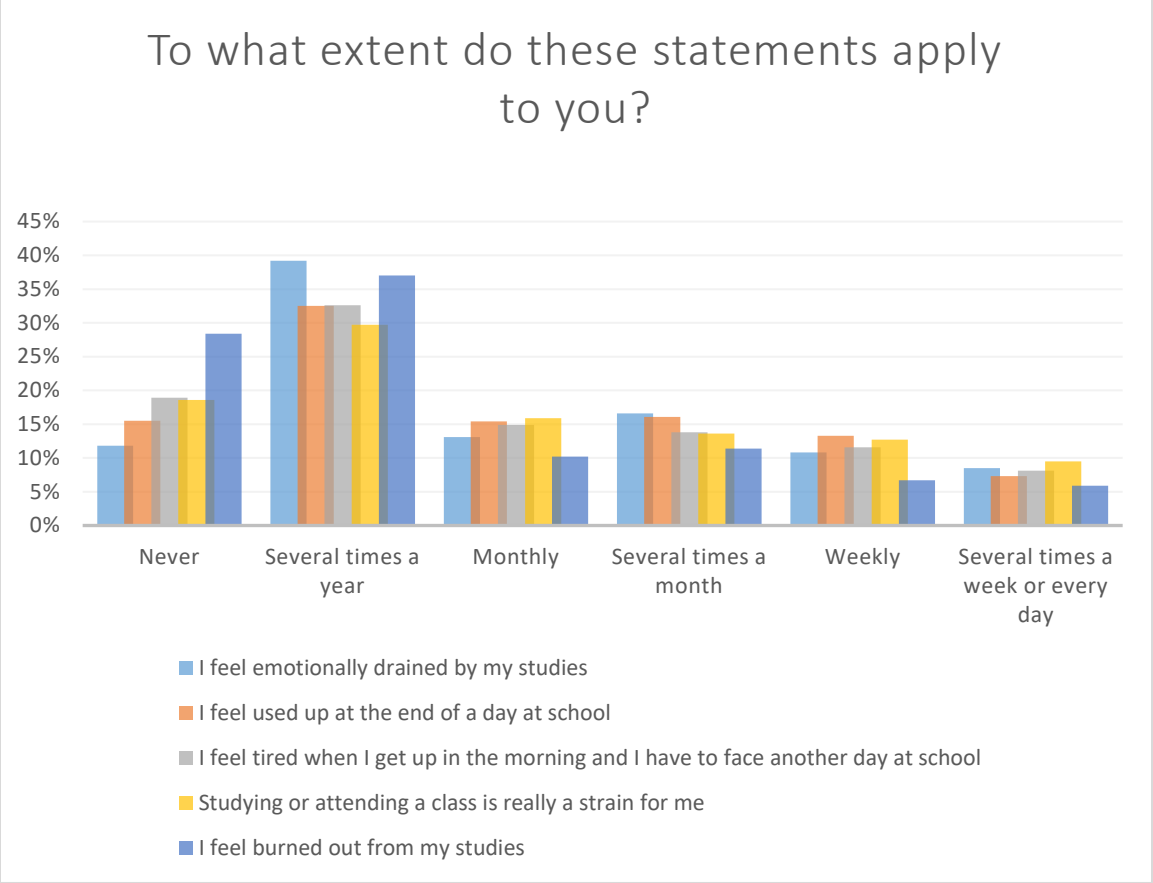
Key points mental wellbeing (3.1 to 3.5)

- The life satisfaction was negatively affected by the COVID-19-outbreak, by decreasing from a grade of 7.38 to 6.58.
- In general, students experience performance pressure regularly, with international students experiencing performance pressure due to their own expectations more often than national students do. During the COVID-19-outbreak, students experienced a little increase in performance pressure, with international students and Master's students experiencing a stronger 'negative' change than national students and Bachelor's 2/3 students, respectively.
- The majority of students (56.9%) had normal resilience, 37.5% had low resilience, and 5.6% had high resilience. We have not been able to study changes in resilience compared to before the COVID-19-oubreak.
- On average, sleeping problems of students significantly increased during the COVID-19-period, by moving from having little trouble sleeping to having not little but also not a lot trouble sleeping.
- Most stress because of COVID-19 was experienced regarding students' studies, worries about their loved ones, society, social distancing, and their financial future. Overall, international students experienced significantly more stress on all sources of stress, except from stress about social distancing. Moreover, Master's students experienced more stress for some items (including financial situation now and in the future) than Bachelor's students.

3.6. Study-related exhaustion

The majority of students (88.2%) reported that they at least sometimes (i.e. several times a year or more) feel emotionally drained by the study (and 49.0% monthly or more often). 71.6% of the students reported feel burned out from their studies at least sometimes by their studies (and 34.2% monthly or more) (Figure 3.7). On average, students had a mean study-related exhaustion score of 2.88 (*SD* = 1.29). This represents a score between monthly and several times a month.

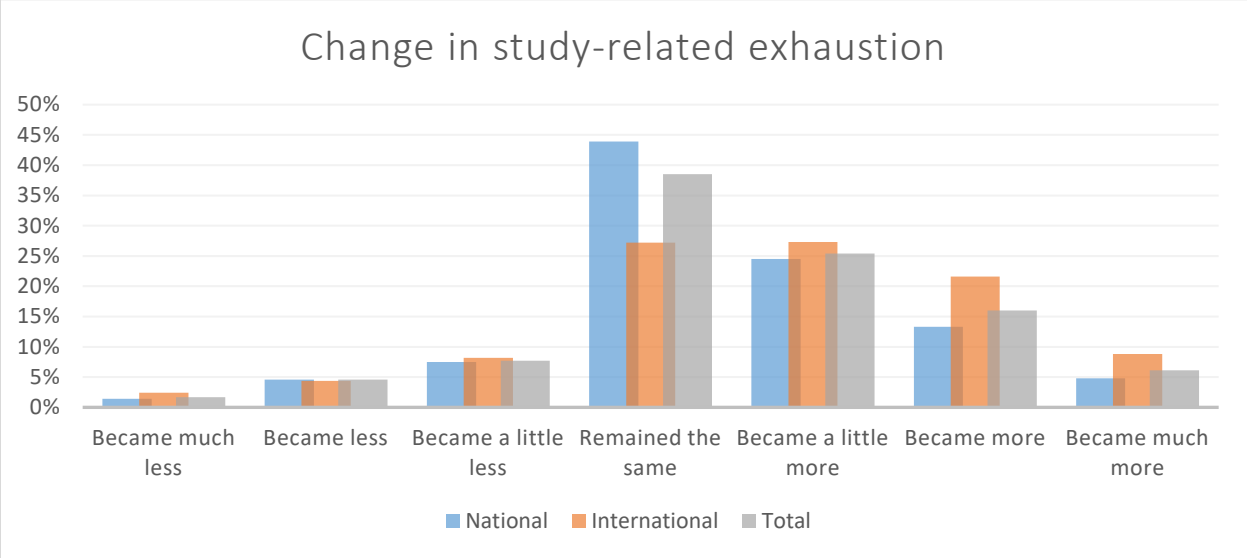
Figure 3.7. Study-related exhaustion items in percentages (n = 1966)



Additional analyses showed international students had significantly more study-related exhaustion (M = 3.24, SD = 1.38) than national students (M = 2.71, SD = 1.20), F (1, 1964) = 76.60, $p < .001$. Additional analyses showed no significant effect of study phase on study-related exhaustion, F (1, 1946) = 1.15, $p > .05$.

We studied whether students experienced a change in their study-related exhaustion at time of participation compared to the period before the COVID-19-outbreak. The largest group of students (38.5%) reported no change, followed by 25.4% that reported to experience a little more exhaustion, and 16.0% reported to experience more exhaustion (Figure 3.8). On average, students reported a change in study-related exhaustion of 4.54 (SD = 1.25), which represents a score between 'remained the same' and 'became a little more'.

Figure 3.8. Change in study-related exhaustion when comparing to the period before the COVID-19-outbreak in percentages, broken down to national versus international students (n = 1953)



Additional analyses showed that international students experience significantly more 'negative' change (M = 4.73, SD = 1.37) than national students (M = 4.44, SD = 1.18), F(1, 1951) = 22.22, p < .001. These scores represent a change of between 'remained the same' and 'became a little worse´, where the study-related exhaustion of international students changed more strongly to the negative side than national students. Additional analyses showed no significant effect of study phase on the change in study-related exhaustion, F (2, 1933) = 2.37, p > .05.

3.7. Mental health

We studied the mental health of students and found that 55.5% of the students was psychologically healthy. 24.0% of the students was psychologically slightly unhealthy, 11.5% was psychologically moderately unhealthy, and 8.9% was psychologically seriously unhealthy.

Additional analyses showed a significant association between mental health and whether or not being an international student. Students seem to be **more** likely to be psychologically unhealthy if they are an international student than if they are a national student (Table 3.9). Other additional analyses showed no significant association between mental health and different study phases, χ^2 (6) = 3.85, p > .05.

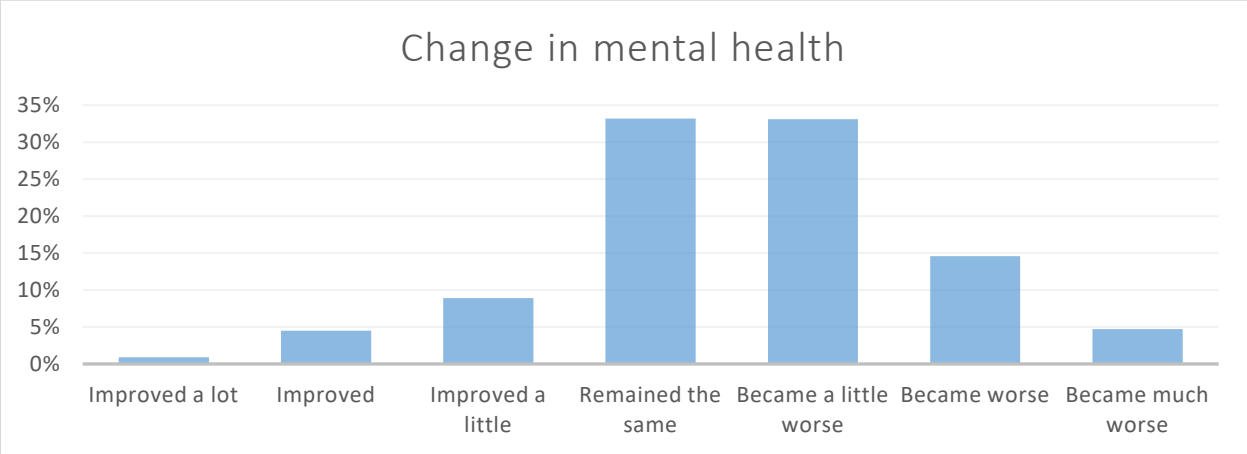
Table 3.9. Chi-square test result of mental health categories by whether or not being an international student (n = 1934)

Mental health category								
Psychologically healthy		Psychologically slightly unhealthy		Psychologically moderately unhealthy		Psychologically seriously unhealthy		
National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	χ-test
60.9% [b]	44.4% [a]	23.7% [b]	24.8% [a]	9.0%	16.6%	6.4% [b]	14.2% [a]	70.84***

****p< .001. Note. Df (3).*

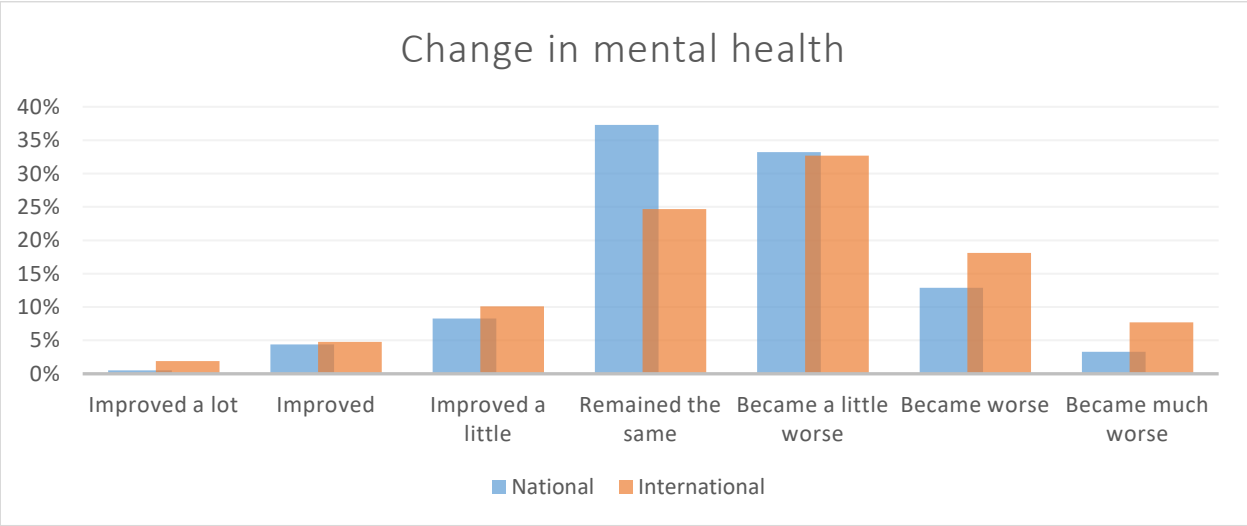
We also studied whether students experienced a change in mental health at time of participation compared to the period before the COVID-19-outbreak. 33.2% of the students reported that their mental health remained the same and a similar percentage of students (33.1%) reported it became a little worse (Figure 3.9). On average, students reported a change in mental health of 4.56 (*SD* = 1.18), which represents a score between 'remained the same' and 'became a little worse'.

Figure 3.9. Change in mental health students experienced compared to the period before the COVID-19-outbreak in percentages (n = 1918)



Additional analyses showed that international students experience significantly more 'negative' change (*M* = 4.67, *SD* = 1.33) than national students (*M* = 4.50, *SD* = 1.09), *F* (1,1916) = 7.84, *p* < .01. These scores represent a change of between 'remained the same' and 'became a little worse, where the mental health of international students changed more strongly to the negative side than national students (Figure 3.10). Additional analyses showed no significant effect of study phase on the change in mental health, *F* (2,1898) = 2.11, *p* > .05.

Figure 3.10. Change in mental health students experienced compared to the period before the COVID-19-outbreak in percentages, broken down to national versus international students (n = 1918)



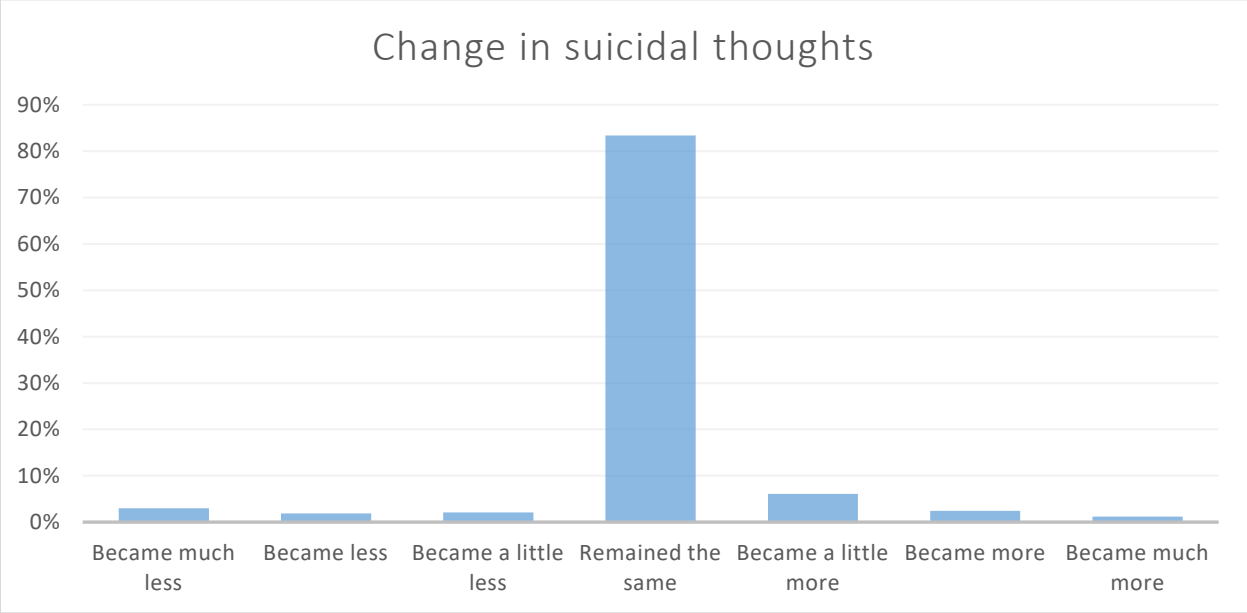
3.8. Suicidal thoughts

Although the majority of students (82.4%) reported to never had suicidal thoughts in the past 4 weeks, 11.0% reported to have these occasionally, 4.7% sometimes, 1.4% usually, and 0.6% (almost) always. The average reported frequency of suicidal thoughts was 1.27 (*SD* = .67), which represents a score between 'never' and 'occasionally'.

Additional analyses showed that international students experienced significantly more suicidal thoughts (*M* = 1.41, *SD* = 0.83) than national students (*M* = 1.20, *SD* = 0.56), *F* (1,1915) = 42.70, *p* < .001. Additional analyses also showed that students in the Bachelor's 2/3 study phase experienced significantly more suicidal thoughts (*M* = 1.33, *SD* = .74) than students in the Master's study phase (*M* = 1.20, *SD* = .56), *F*(2,1897) = 9.08, *p* < .001.

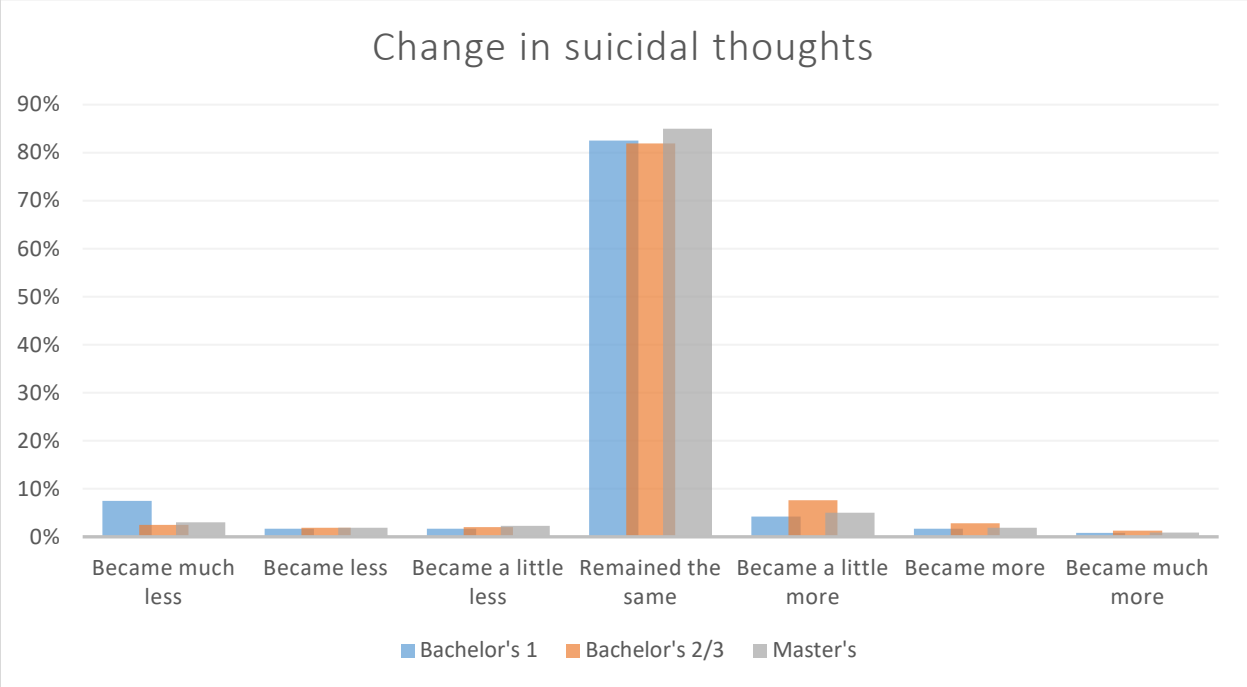
We also studied whether students experienced a change in potential suicidal thoughts at time of participation compared to the period before the COVID-19-outbreak. The majority of students (83.4%) reported that their suicidal thoughts remained the same, followed by 6.1% of the students that reported that they had a little more suicidal thoughts (Figure 3.11). On average, students reported a change in suicidal thoughts of 3.99 (*SD* = .79), which represents a score of 'remained the same'.

Figure 3.11. Change in suicidal thoughts of students when comparing to the period before the COVID-19-outbreak in percentages (n = 1913)



Additional analyses showed no significant effect of being an international versus national student on the change in suicidal thoughts, *F* (1, 1911) = 2.94, *p* > .05. Other additional analyses did show a significant effect of study phase on suicidal thoughts, *F (*2, 1893) = 4.863, *p* < .01. The Bonferroni *post hoc* test revealed that Bachelor's 1 students scored significantly lower (*M* = 3.83, *SD* = .07) than Bachelor's 2/3 students (*M* = 4.04, *SD* = .3.83). These scores represent a change of between 'became a little less' and 'remained the same', where Bachelor's 1 students tend to experience their suicidal thoughts became a little less, whereas suicidal thoughts of Bachelor's 2/3 students remained on the same level (Figure 3.12).

Figure 3.12. Change in suicidal thoughts of students when comparing to the period before the COVID-19-outbreak in percentages, broken down to study phase (n = 1896)



3.9. Loneliness

We studied the extent to which students experienced loneliness and found that 43.8% of the students was somewhat lonely, 35.8% was not lonely, and 20.4% was seriously lonely.

Additional analyses showed a significant association between loneliness and whether or not being an international student, χ^2 (2) = 173.36, p < .001. International students seem to be **more** likely to be (both seriously and somewhat) lonely than national students. National students seem to be **more** likely to be not lonely than international students (Table 3.10). Other additional analyses showed no significant association between loneliness and different study phases, χ^2(4) = 8.08, p > .05.

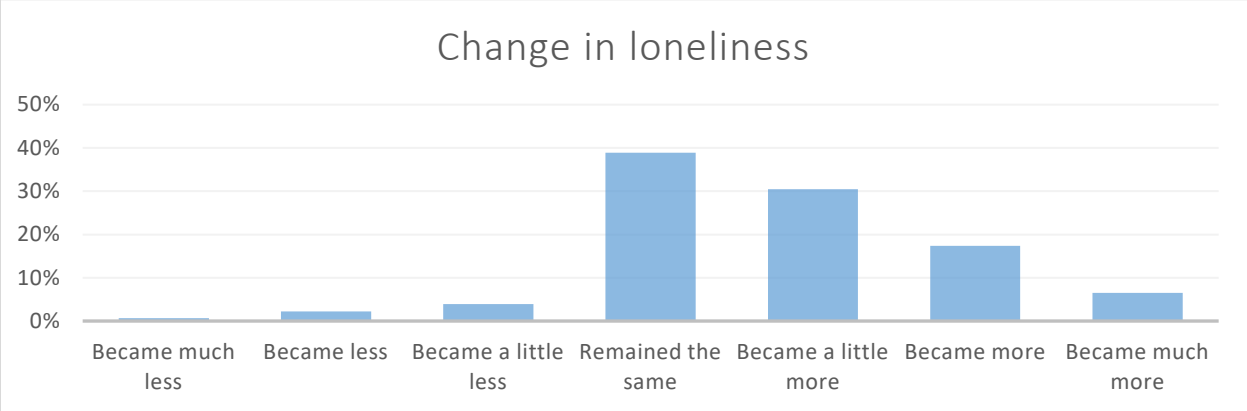
Table 3.10. Chi-square test result of loneliness categories by whether or not being an international student (n = 1890)

Loneliness category						
Not lonely		Somewhat lonely		Seriously lonely		
National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	χ-test
44.9% [b]	17.0% [a]	49.5% [b]	41.1% [a]	33.4% [b]	14.1% [a]	173.36***

****p< .001. Note. Df (2).*

We also studied whether students experienced a change in feelings of loneliness at time of participation compared to the period before the COVID-19-outbreak. 38.9% of the students reported that they experienced the same amount of loneliness than before the COVID-19-outbreak and 30.5% of the students reported to experience a little more loneliness. 23.9% reported that their feelings of loneliness became (much) more (Figure 3.8). On average, students reported a change in loneliness of 4.75 (*SD* = 1.10), which represents a score between 'remained the same' and 'became a little more´.

Figure 3.13. Change in loneliness students experienced compared to the period before the COVID-19-outbreak in percentages (n = 1889)



Additional analyses showed no significant effect of being an international versus national student on the change in loneliness, F (1, 1887) = .839, p > .05. Also, no significant effect of study phase on the change in loneliness was found, F (2,1869) = 1.90, p > .05.

Key points mental wellbeing (3.6 to 3.9)

- In general, students experience study-related exhaustion monthly or several times a month, with international students experiencing exhaustion more often than national students do. During the COVID-19-outbreak, students experienced a little increase in study-related exhaustion, with international students experiencing a stronger 'negative' change than national students.
- At time of participation, almost half of the students was psychologically unhealthy, ranging from being slightly unhealthy to being seriously unhealthy. International students seem more likely to be psychologically unhealthy than national students. Compared to the period before the COVID-19-outbreak, students experienced a little worsening of mental health, with international students experiencing a stronger 'negative' change than national students.
- One in six students reported to have suicidal thoughts to some degree, ranging from having these occasionally to (almost) always. International students and Bachelor's 2/3 students have these thoughts more often than national students and Master's students, respectively. During the COVID-19-outbreak, average frequency of suicidal thoughts remained the same.
- 35.8% of the students did not feel lonely, whereas 43.8% was somewhat lonely, and 20.4% was seriously lonely. International students seem more likely to be lonely than national students. During the COVID-19-outbreak, students experienced a little increase of feelings of loneliness. Almost one in four students (23.9%) reported their loneliness became (much) more.

3.10. Substance use

Alcohol use

First, results showed that 12.7% of the students are abstainers. Additional analyses showed a significant association between abstinence from alcohol and whether or not being an international student. International students seem **more** likely than national students to abstain from alcohol (Table 3.11). We found no significant association between abstinence from alcohol and different study phases, $\chi^2(2) = .63$, $p > .05$.

Table 3.11. Chi-square test result of abstinence from alcohol by whether or not being an international student (n = 1910)

Abstainer		Drinker		
National (a)	International (b)	National (a)	International (b)	χ-test
11.1% [b]	16.1% [a]	88.9% [b]	83.9% [a]	9.35**

***p< .01. Note. Df (1).*

Second, results showed that 73.2% of the students drink on a non-acceptable level, if adhering to the Dutch Health Council guidelines (more than one glass of alcohol per day). Additional analyses showed a significant association between non-acceptable drinking and whether or not being an international student. National students seem **more** likely than international students to drink on a non-acceptable level (Table 3.12). We found no significant association between non-acceptable drinking and different study phases, $\chi^2(2) = 1.16$, $p > .05$.

Table 3.12. Chi-square test result of unacceptable drinking by whether or not being an international student (n = 1901)

Acceptable		Non-acceptable		
National (a)	International (b)	National (a)	International (b)	χ-test
23.3% [b]	34.1% [a]	76.7% [b]	65.9% [a]	24.80***

****p< .001. Note. Df (1).*

Third, results showed that 15.3% of the students drink on a non-moderate level (more than 14 glasses per week for women and more than 21 glasses per week for men). Additional analyses showed a significant association between non-moderate drinking and whether or not being an international student. National students seem **more** likely than international students to drink on a non-moderate level (Table 3.13). We found no significant association between unacceptable drinking and different study phases, $\chi^2(2) = 2.72$, $p > .05$.

Table 3.13. Chi-square test result of non-moderate drinking by whether or not being an international student (n = 1906)

Moderate		Non-moderate		
National (a)	International (b)	National (a)	International (b)	χ-test
82.4% [b]	89.5% [a]	17.6% [b]	10.5% [a]	16.56***

****p< .001. Note. Df (1).*

Fourth, results showed that 13.6% of the students fall above the cut-off value for problematic alcohol use (AUDIT-C score: ≥ 8 for men, ≥ 7 for women and other; Verhoog et al., 2019). Additional analyses showed a significant association between problematic alcohol use and whether or not being an international student. National students seem **more** likely to fall above the AUDIT-C cut-off value for problematic alcohol use than international students (Table 3.14). We found no significant association between problematic alcohol use and different study phases, $\chi^2(2) = .65$, $p > .05$.

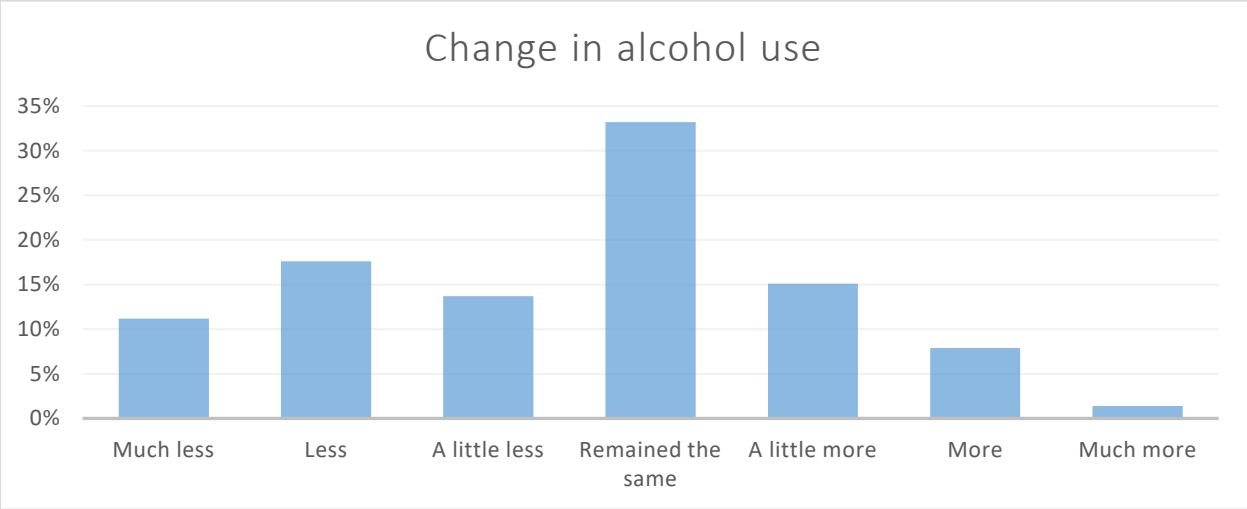
Table 3.14. Chi-square test result of problematic alcohol use by whether or not being an international student (n = 1906)

Non-problematic		Problematic		
National (a)	International (b)	National (a)	International (b)	χ-test
84.6% [b]	90.0% [a]	15.4% [b]	10.0% [a]	10.46***

***p< .01. Note. Df (1).*

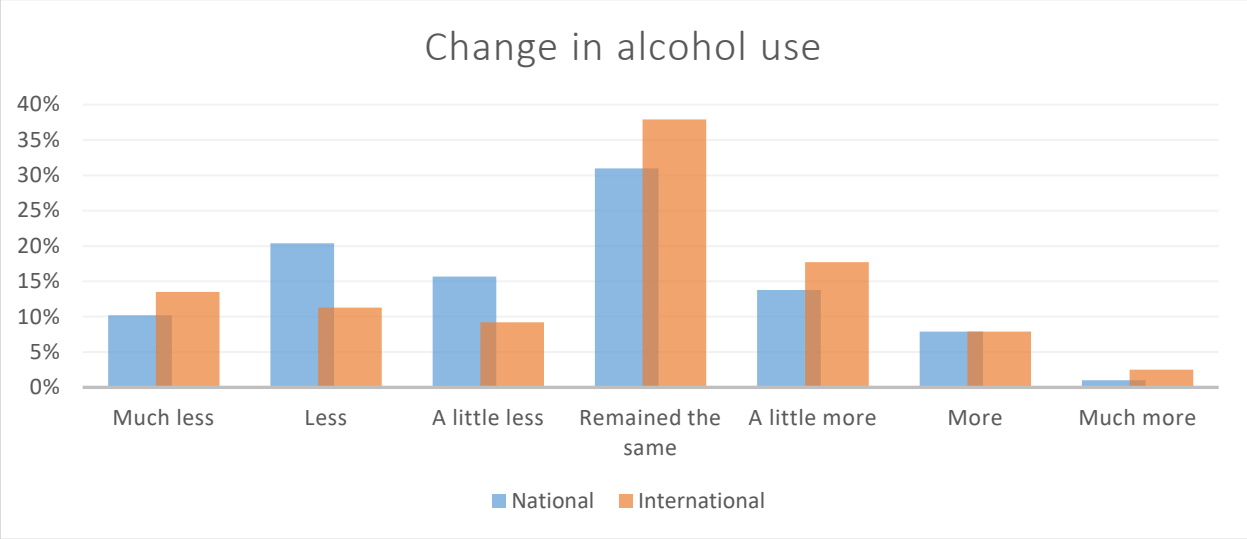
We studied whether students experienced a change in their drinking habits compared to the period before the COVID-19-outbreak. 33.2% of the students reported to drink the same amount of alcohol, 17.6% reported to drink less alcohol, and 15.1% reported to drink a little more alcohol (Figure 3.16). On average, students reported a change in alcohol use of 3.53 (*SD* = 1.49), which represents a score between 'a little less' and 'remained the same'.

Figure 3.16. Change in alcohol use compared to the period before the COVID-19-outbreak in percentages (n = 1661)



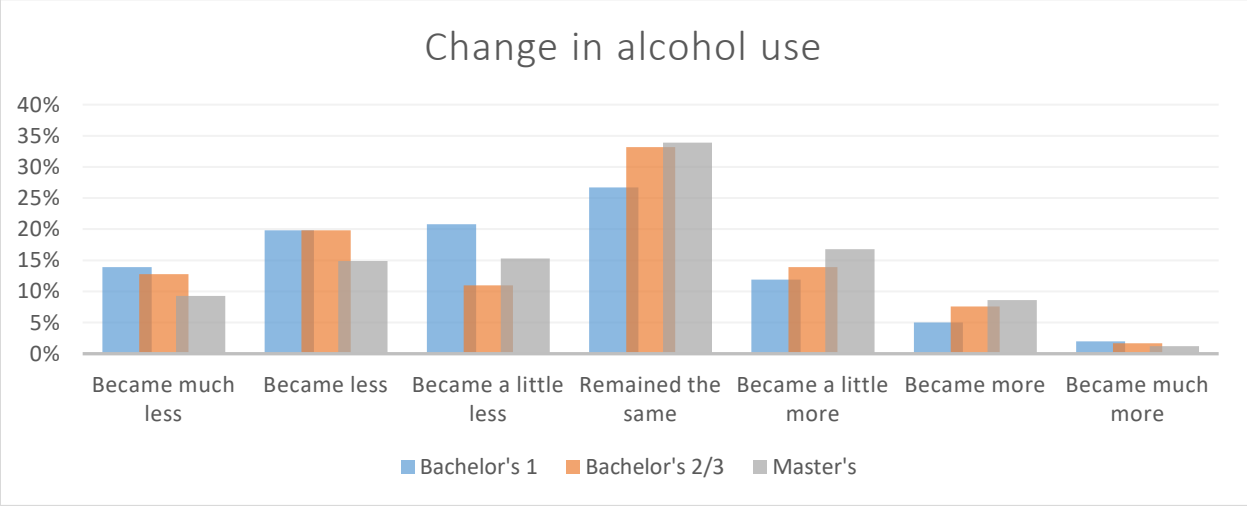
Additional analyses showed that the alcohol use of national students changed significantly more to drinking less (*M* = 3.45, *SD* = 1.46) than international students (*M* = 3.69, *SD* = 1.54), *F* (1,1659) = 8.67, *p* < .01. These scores represent a change of between 'became a little less' and 'remained the same', where the alcohol use of national students changed more strongly to the 'healthier' side than international students.

Figure 3.9. Change in alcohol use of students compared to the period before the COVID-19-outbreak in percentages, broken down to national versus international students (n = 1661)



Other additional analyses showed that the alcohol use of both Bachelor's 1 and Bachelor's 2/3 students changed significantly more to drinking less (M = 3.26, SD = 1.49 and M = 3.45, SD = 1.53, respectively) than Master's students (M = 3.65, SD = 1.44), F (2,1641) = 5.13, p < .01. These scores represent a change of between 'became a little less' and 'remained the same', where the alcohol use of Bachelor's 1 and Bachelor's 2/3 students changed more strongly to the 'healthier' side than Master's students.

Figure 3.5. Change in alcohol use compared to the period before the COVID-19-outbreak in percentages, broken down to study phase (n = 1644)



Use of other substances

For most of the presented substances, the majority of students (80.9%-98.5%) reported to have never used these. An exception is cannabis, which 50.6% of the students reported to have ever used. Within the group that reported to have used cannabis, the last time of use strongly varied. Cannabis is followed by XTC, which 19.1% of the students reported to have ever used (Table 3.15). In the 'other, namely'-

textbox, some respondents also indicated to have used other substances, including mephedrone/4-MMC (0.3%), speed (0.4%), 3-MMC (0.3%), 4-ho-met/mipt (0.2%), and melatonine (0.3%).

Table 3.15. Use of other substances in percentages (n = 1904)

Substance	No, never used	Yes, but more than 12 months ago	Yes, in last 12 months, but not in last 30 days	Yes, in the last 30 days
Cannabis (hash, weed, marijuana)	49,0%	18,1%	16,5%	16,0%
XTC (ecstasy, MDMA)	80,9%	7,7%	7,8%	3,6%
LSD	95,8%	2,2%	1,4%	0,7%
Mushrooms or truffles	88,4%	5,5%	4,8%	1,3%
Cocaïne	90,1%	4,4%	3,8%	1,6%
2C-B	95,1%	2,6%	1,5%	0,8%
GHB or GBL	98,0%	1,4%	0,5%	0,2%
Ketamine	91,80%	2,9%	3,3%	2,0%
4-Fluoramphetamine	96,30%	3,4%	0,4%	0,0%
Nitrous oxide	83,90%	12,00%	3,40%	0,8%
Methylphenidate/dexamphetamine without doctor's prescription (e.g. Ritalin, Concerta)	92,90%	3,8%	2,6%	0,8%
Modafinil without doctor's prescription	98,50%	0,9%	0,5%	0,2%
Sleep medication/sedatives without doctor's prescription (e.g. Temazepam, Oxazepam, Valium, and Seresta)	93,60%	2,7%	2,0%	1,6%

Additional analyses showed significant associations between the use of various substances and whether or not being an international student. As for cannabis (hash, weed, marijuana), international students seem **more** likely to have used this in the last year than national students. In addition, national students seem **more** likely to have never used cannabis or to have used cannabis more than a year ago. As for XTC (ecstasy, MDMA), national students seem **more** likely to have used this in the last 30 days than international students. In addition, international students are **more** likely to have never used this than national students. Finally, as for mushrooms and/or truffles, national students seem to be **more** likely to have never used these than international students, whereas international students seem to be **more** likely to have used these in the last 12 months (but not in the last 30 days). Associations of all other reported substances were not significant or could not be tested because test assumptions were not met (Table 3.16).

Table 3.16. Chi-square test results on use of other substances, broken down to national versus international students (n = 1904)

	Time of use								
	No, never used		Yes, but more than 12 months ago		Yes, in last 12 months, but not in last 30 days		Yes, in the last 30 days		
Substance	National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	χ-test
Cannabis (hash, weed, marijuana)	54.7% [b]	38.5% [a]	19.5% [b]	15.3% [a]	12.1% [b]	25.5% [a]	13.7% [b]	20.6% [a]	83.65 ***
XTC (ecstasy, MDMA)	78.6% [b]	85.6% [a]	8.0%	6.9%	8.5%	6.5%	4.9% [b]	1.0% [a]	23.24 ***
LSD	97.0%	93.4%	1.4%	3.7%	1.0%	2.1%	0.6%	0.8%	NP
Mushrooms or truffles	60.7% [b]	27.7% [a]	4.9%	6.8%	3.7% [b]	7.1% [a]	1.3%	1.1%	13.73 **
Cocaine	89.6%	91.1%	4.8%	3.7%	4.0%	3.4%	1.6%	1.8%	5.40
2C-B	93.8%	97.9%	3.4%	0.8%	1.8%	1.0%	1.0%	0.3%	NP
GHB or GBL	97.3%	99.4%	1.9%	0.3%	0.6%	0.3%	0.2%	0.0%	NP
Ketamine	91.0%	93.4%	2.9%	3.1%	3.7%	2.3%	2.3%	1.3%	5.40
4-Fluoramphetamine	94.9%	99.0%	4.6%	0.8%	0.5%	0.2%	0.0%	0.0%	NP
Nitrous oxide	78.3%	95.6%	16.6%	2.4%	4.1%	1.9%	1.0%	0.0%	NP
Methylphenidate/dexamphetamine without doctor's prescription	91.7%	95.3%	44.4%	2.6%	3.1%	1.5%	0.9%	0.6%	NP
Modafinil without doctor's prescription	98.5%	98.4%	0.8%	1.1%	0.5%	0.3%	0.2%	0.2%	NP
Sleep medication/sedatives without doctor's prescription	93.8%	93.1%	2.7%	2.7%	1.7%	2.7%	1.7%	1.5%	2.36

***p < .01, *** p < .001. Note. NP = not possible, due to not meeting test assumptions. Df (3).*

Additional analyses also showed a significant association between the use of cannabis and different study phases. We found that Master's students seem **more** likely than Bachelor's 1 and Bachelor's 2/3 students to have used cannabis more than a year ago. In addition, we found that Master's students seem **less** likely than Bachelor's 1 and Bachelor's 2/3 students to have used cannabis in the last month (Table 3.17). Analyses of all other reported substances were not possible because test assumptions were not met.

Table 3.17. Chi-square test results on cannabis use, broken down to study phase (n = 1887)

Time of use												
No, never used			Yes, but more than 12 months ago			Yes, in last 12 months, but not in last 30 days			Yes, in the last 30 days			
Bachelor's 1 (a)	Bachelor's 2/3 (b)	Master's (c)	Bachelor's 1 (a)	Bachelor's 2/3 (b)	Master's (c)	Bachelor's 1 (a)	Bachelor's 2/3 (b)	Master's (c)	Bachelor's 1 (a)	Bachelor's 2/3 (b)	Master's (c)	χ-test
56.3%	49.7%	48.7%	8.4% c	15.2% c	21.9% a b	18.5%	16.9%	15.7%	16.8% c	18.2% c	13.7% a b	25.17***

*** p < .001. Note. Df (6).*

When a student indicated to have used a particular substance, they were asked whether the use of this substance had generally changed from the period before the COVID-19 outbreak. For most substances, the majority indicated that their use has remained the same. An exception to this are sleep medication/ sedatives without doctor's prescription, which the largest group of students that indicated to use this (n=70) has started using **more** since the outbreak (35.7%) and the psychedelic substance 2C-B which 25% (n=44) used **more**. Since the COVID-19 outbreak the main drugs that students have **started** to use were 2C-B (22.7%, n=44), LSD (17.9%, n=39) and sleep medication/sedatives (17.1%, n=70) (Table 3.18).

Table 3.18. Change in use of other substances in percentages

Substance	I've been using this drug since the COVID-19-outbreak	I've been using this drug since the COVID-19-outbreak more/more often	My use of this drug has remained the same since the COVID-19-outbreak	I've been using this drug less/less often since the COVID-19-outbreak	I've stopped using this drug since the COVID-19-outbreak
Cannabis (hash, weed, marijuana) (*n* = 645)	4.0%	20.0%	46.4%	14.9%	14.7%
XTC (ecstasy, MDMA) (*n* = 218)	5.0%	4.6%	41.3%	30.3%	18.8%
LSD (*n* = 39)	17.9%	7.7%	43.6%	10.3%	20.5%
Mushrooms or truffles (*n* = 116)	8.6%	9.5%	51.7%	10.3%	19.8%
Cocaine (*n* = 104)	4.8%	5.8%	42.3%	20.2%	26.9%
2C-B (*n* = 44)	22.7%	25.0%	40.9%	6.8%	4.5%
GHB or GBL (*n* = 13)	0.0%	7.7%	38.5%	15.4%	38.5%
Ketamine (*n* = 100)	13.0%	14.0%	39.0%	16.0%	18.0%
4-Fluoramphetamine (*n* = 7)	0.0%	0.0%	57.1%	14.3%	28.6%
Nitrous oxide (*n* = 78)	3.8%	9.0%	52.6%	10.3%	24.4%
Methylphenidate/dexamphetamine without doctor's prescription (e.g. Ritalin, Concerta) (*n* = 64)	9.4%	10.9%	45.3%	17.2%	17.2%
Modafinil without doctor's prescription (*n* = 12)	16.7%	8.3%	33.3%	25.0%	16.7%
Sleep medication/sedatives without doctor's prescription (e.g. Temazepam, Oxazepam, Valium, and Seresta) (*n* = 70)	17.1%	35.7%	24.3%	12.9%	10.0%

Additional analyses showed a significant association between the change in use of various substances and whether or not being an international student, χ^2 (4) = 36.18, p < .001. Students seem to be **more** likely to use cannabis more/more often since the COVID-19-outbreak if they are a national student than if they are an international student. Students seem to be **more** likely to have stopped using cannabis if they are an international student than if they are a national student (Table 3.19). Analyses of all other

reported substances, and analyses to study associations between changes in use of various substances and different study phases, were not possible because certain test assumptions were not met.

Table 3.19. Chi-square test result of change in cannabis use by whether or not being an international student (n = 1890)

Change in use										
I've been using this drug since the COVID-19-outbreak		I've been using this drug since the COVID-19-outbreak more/more often		My use of this drug has remained the same since the COVID-19-outbreak		I've been using this drug less/less often since the COVID-19-outbreak		I've stopped using this drug since the COVID-19-outbreak		
National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	χ-test
3.9%	4.2%	25.0% [b]	14.6% [a]	49.7%	42.7%	14.0%	15.9%	7.4% [b]	22.7% [a]	24.79***

****p< .001. Note. Df (4).*

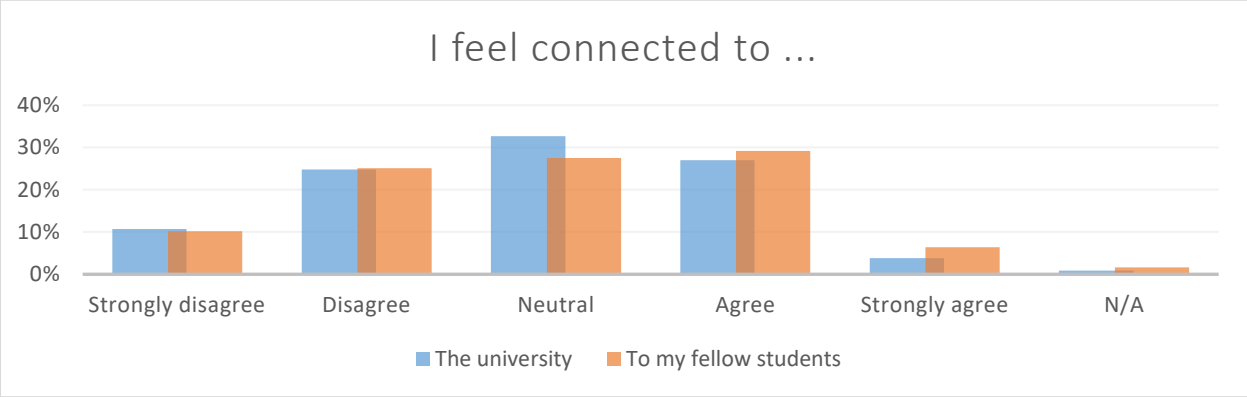
Keypoints substance use

- 12.7% of the students are alcohol abstainers, international students were more likely to abstain than national students. 73.2% of the students drink alcohol on a non-acceptable level, if adhering to the Dutch Health Council guidelines, 15.3% drink on a non-moderate level, and 13.6% fall above the cut-off value for problematic alcohol use. National students seem more likely than international students to drink on a non-acceptable, non-moderate, and problematic level.
- 42.4% of the students reported to drink less alcohol than before the COVID-19-outbreak, 33.2% reported to drink the same amount of alcohol, and 24.4% reported to drink more alcohol. On average, students reported to drink a little less. This reduction was more profound for national students and Bachelor's 1 and Bachelor's 2/3 students.
- For most of the substances, the majority of students (80.9%-98.5%) reported to have never used these, with the exception of cannabis use where 50.6% reported to have ever used. There were some differences between international and national students in the use of cannabis, xtc, and mushrooms/truffles. E.g. international students seemed more likely to have used cannabis in the last 12 months than national students. National students seemed more likely to have used XTC in the last 30 days. Furthermore, Bachelor's 2/3 students seemed more likely to have used cannabis in the last 30 days than Master's students.
- In general, the use of substances have remained the same compared to the period before the COVID-19-outbreak, except from users of sleep medication/sedatives without doctor's prescription (*n* = 70) and the psychedelic substance 2C-B (*n* = 44), where approximately half of the users reported to either have started using this or have used this more/more often since the outbreak. National students seem more likely to have used cannabis more/more often since the COVID-19-outbreak, whereas international students seem more likely to have stopped their cannabis use since the outbreak.

4. Connectedness with university and fellow students

To the statement that asked students whether they felt connected with their university, the largest group of students (32.7%) reported to be neutral. Regarding the statement whether they felt connected to their fellow students, the largest group of students (29.2%) reported to agree with the statement (Figure 3.3). On average, students reported to slightly disagree with the statement of feeling connected with their university (*M* = 2.88, *SD* = 1.05) and to be neutral with the statement of feeling connected with their fellow students (*M* = 2.97, *SD* = 1.11).

Figure 4.1. Connectedness with university and fellow students in percentages (n = 1898)



Additional analyses showed no statistically significant differences in connectedness between national and international students, *Wilks' Lambda* = .997, *F* (2, 1860) = 2.94, *p* > .05. We also found no significant differences between different study phases and connectedness, *Wilks' Lambda* = .997, *F* (4, 3684) = 1.54, *p* > .05. We did find statistically significant differences in connectedness between different schools, *Wilks' Lambda* = .982, *F* (8, 3612) = .98, *p* < .001. The Games-Howell *post hoc* test revealed that TSB and TSHD students felt significantly less connected with the university than TiSEM students. In addition, we found that TLS students felt significantly less connected with their fellow students than TiSEM students.

Table 4.1. MANOVA test results on connectedness, broken down to school (n = 1812)

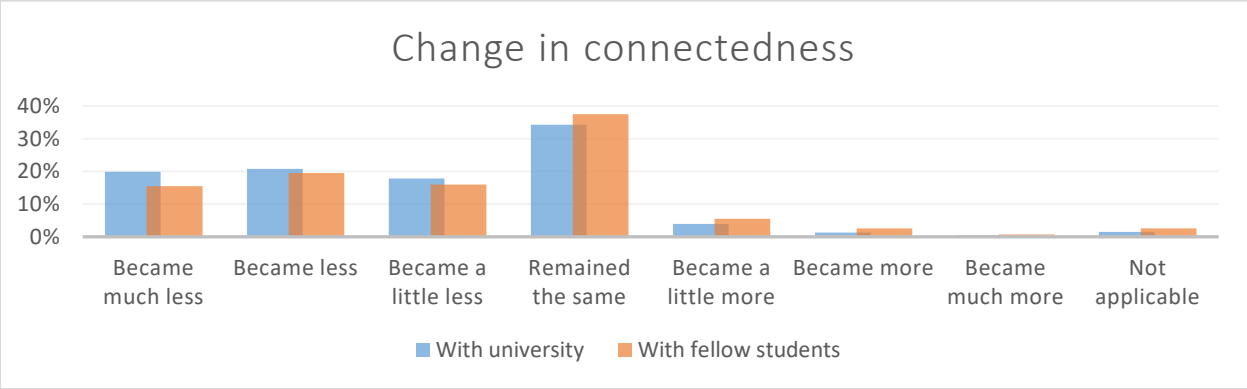
	School										
	TiSEM (a)		TLS (b)		TSB (c)		TSHD (d)		TST (e)		
Connectedness with	*M*	*SD*	*M*	*SD*	*M*	*M*	*SD*	*M*	*SD*	*M*	*F*-test
University	3.00 [c d]	1.01	2.94	1.04	2.80 [a]	1.03	2.77 [a]	1.12	3.00	.96	4.09**
Fellow students	3.07 [b]	1.08	2.83 [a]	1.14	2.91	1.10	2.95	1.11	3.40	1.00	3.82**

*** p < .01. Note. M = Mean, SD = Standard Deviation. Both statements of connectedness were scored on a scale from 1 (strongly disagree) to 5 (strongly agree). Df (4, 1807).*

We were also interested in whether the students experienced a change in feelings of connectedness compared to the period before the COVID-19-outbreak. As for connectedness with the university, the largest group of students (34.3%) reported no change. Similarly, for connectedness with fellow students, the largest group (37.5%) reported no change (Figure 4.2). On average, students, students reported a change in feelings of connectedness with the university of 2.87 (*SD* = 1.31), which represents a score

between ‘became a little less’ and ‘remained the same’. As for feelings of connectedness with fellow students, this average was 3.09 (*SD* = 1.34), which meant these feelings remained the same.

Figure 4.2. Change in connectedness compared to the period before the COVID-19-outbreak in percentages (n = 1893)



Additional analyses showed no significant effect in change of feelings of connectedness between national and international students, *Wilks’ Lambda* = .998, *F* (2, 1833) = 2.27, *p* > .05. Additional analyses did show a significant effect of study phase on the change in feelings of connectedness, *Wilks’ Lambda* = .994, *F* (4, 3630) = 2.80, *p* < .05. The Games-Howell *post hoc* test revealed that Bachelor’s 1 students experience significantly more ‘negative’ change than Master’s students, both in connectedness with university and with fellow students (Table 4.2, Figure 4.3, Figure 4.4).

Table 4.2. MANOVA test results on change in connectedness, broken down to study phase (n = 1819)

	Study phase						
	Bachelor’s 1 (a)		Bachelor’s 2/3 (b)		Master’s (c)		
Connectedness with	*M*	*SD*	*M*	*SD*	*M*	*M*	*F*-test
University	2.58 [c]	1.21	2.86	1.30	2.93 [a]	1.32	3.67*
Fellow students	2.80 [c]	1.34	3.04	1.30	3.17 [a]	1.37	4.80**

**p < .05, **p < .01. Note. M = Mean, SD = Standard Deviation. Change in connectedness was scored on a scale from 1 (became much less) to 7 (became much more). Df (2, 1816).*

Figure 4.3. Change in feelings of connectedness with university compared to the period before the COVID-19-outbreak in percentages, broken down to study phase (n = 1876)

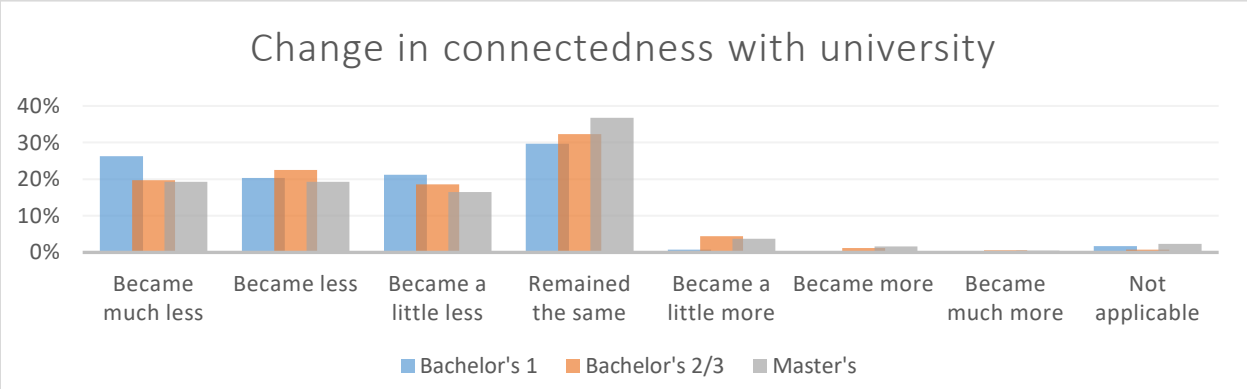
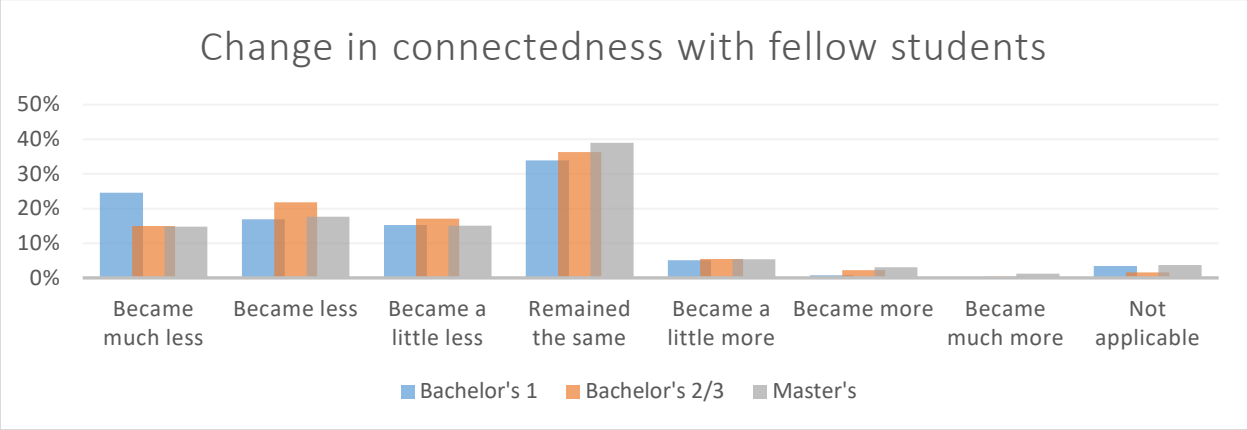


Figure 4.4. Change in feelings of connectedness with fellow students compared to the period before the COVID-19-outbreak in percentages, broken down to study phase (n = 1876)



Finally, additional analyses showed a significant effect of school on the change in feelings of connectedness with the university, *Wilks' Lambda* = .987, *F* (8, 3556) = 2.99, *p* < .01. The Games-Howell *post hoc* test revealed that TSB students experienced significantly more 'negative' change than TiSEM and TLS students, both in connectedness with university and with fellow students. More specifically, TiSEM and TLS students tended to have experienced a little more connectedness with their fellow students than TSB students (Table 4.3, Figure 4.5, Figure 4.6).

Table 4.3. MANOVA test results on change in connectedness, broken down to school (n = 1784)

	School										
	TiSEM (a)		TLS (b)		TSB (c)		TSHD (d)		TST (e)		
Connectedness with	*M*	*SD*	*M*	*SD*	*M*	*M*	*SD*	*M*	*SD*	*M*	*F*-test
University	2.97 [c]	1.26	3.03 [c]	1.34	2.68 [a b]	1.31	2.84	1.31	3.04	1.34	5.16***
Fellow students	3.14 [c]	1.26	3.26 [c]	1.39	2.91 [a b]	1.35	3.07	1.35	3.36	1.11	4.24**

*** p < .01, ***p < .001. Note. M = Mean, SD = Standard Deviation. Change in connectedness was scored on a scale from 1 (became much less) to 7 (became much more). Df (4, 1779).*

Figure 4.5. Change in feelings of connectedness with university compared to the period before the COVID-19-outbreak in percentages, broken down to school (n = 1845)

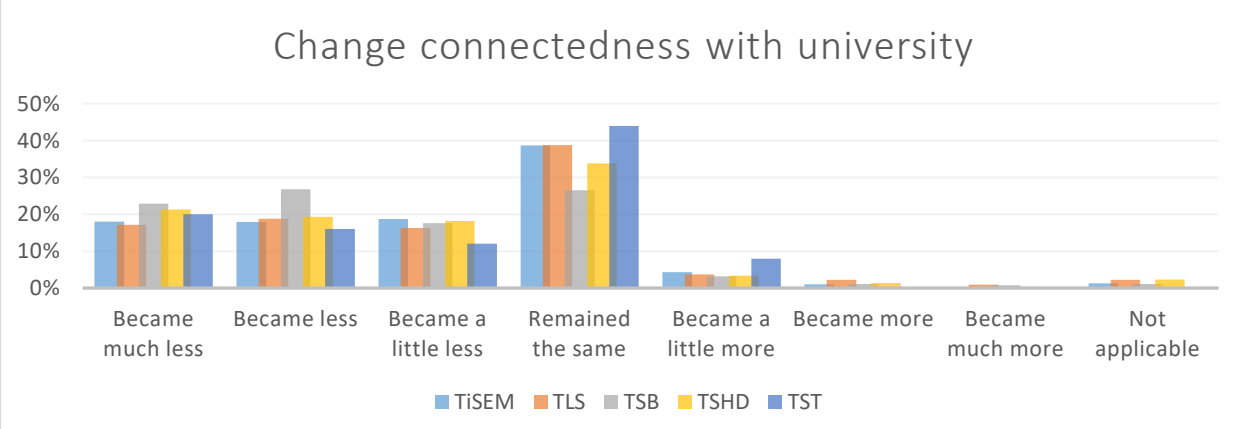
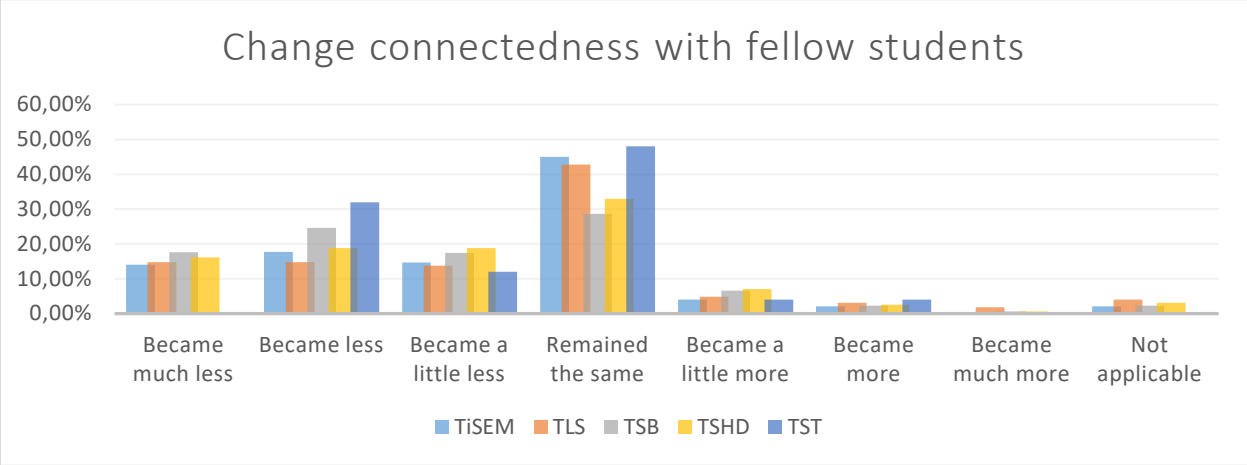


Figure 4.6. Change in feelings of connectedness with fellow students compared to the period before the COVID-19-outbreak in percentages, broken down to school (n = 1845)



Keypoints feelings of connectedness

- On average, at the time of participation, students felt slightly disconnected with the university and felt connected with their fellow students. TSB and TSHD students felt significantly less connected with the university than TiSEM students. TLS students felt significantly less connected with their fellow students than TiSEM students.
- Compared to the period before the COVID-19-outbreak, students reported their feelings of connectedness to the university became a little less. Students experienced no change in connectedness with fellow students. Bachelor's 1 students experienced significantly more 'negative' change than Master's students in connectedness to the university as to fellow students. TSB students experienced more 'negative' change than TiSEM and TLS students, where the latter two tended to have experienced a little more connectedness with fellow students.

5. Experienced (social) support

5.1. Support by various sources

Sources that students (strongly) agreed to feel supported by were family (86.3%), friends (82.9%), and partner (48.9%). Students seem divided when it comes to feeling supported by fellow students, lecturers, and university's student counselors (Figure 5.1). On average, the source that students felt most supported by were partner (if they had one), family, and friends. These scores represented a score between 'agree' and 'strongly agree' (Table 5.1).

Figure 5.1. Extent to which students felt supported by various sources in percentages (n = 1898)

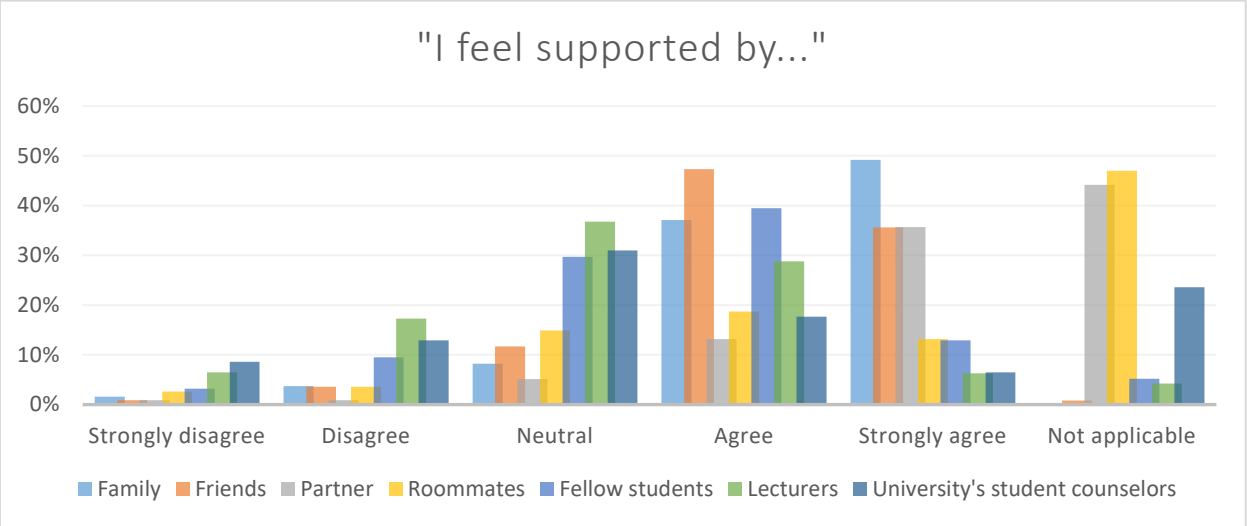


Table 5.1. Total scores on feeling supported by various sources

	M	*SD*
Family (*n* = 1894)	4.29	.89
Friends (*n* = 1883)	4.14	.83
Partner (*n* = 1060)	4.46	.86
Roommates (*n* = 1006)	3.68	1.07
Fellow students (*n* = 1799)	3.52	.96
Lecturers (*n* = 1818)	3.12	1.00
University's student counselors (*n* = 1450)	3.00	1.08

Note. M = Mean, SD = Standard Deviation. All statements with sources of support were scored on a scale from 1 (strongly disagree) to 5 (strongly agree).

Additional analyses showed statistically significant differences in experienced support of some sources between international and national students (Table 5.2). We found that international students experienced significantly more support than national students from family and lecturers. National students experienced significantly more support than international students from partner and roommates. Differences between national and international students in other sources of support were not significant.

Table 5.2. ANOVA test results on extent to which students experienced social support by various sources, broken down to national versus international students

	Group					
	National (a)		International (b)			
Source of support	*M*	*SD*	*M*	*SD*	(df_1, df_2)	*F*-test
Family (n = 1894)	4.25 [b]	.88	4.37 [a]	.90	(1,1892)	8.39*
Friends (n=1883)	4.14	.79	4.14	.92	(1,1881)	.01
Partner (n=1060)	4.56 [b]	.75	4.29 [a]	1.00	(1,1058)	23.71***
Roommates (n=1006)	3.80 [b]	1.01	3.51 [a]	1.14	(1,1004)	17.70***
Fellow students (n=1799)	3.54	.94	3.47	1.01	(1,1797)	2.03
Lecturers (n=1818)	3.07 [b]	.96	3.22 [a]	1.07	(1,1816)	9.37**
University's student counselors (n=1450)	2.98	1.07	3.04	1.12	(1,1448)	1.15

**p < .05, **p < .01, ***p < .001. Note. M = Mean, SD = Standard Deviation. All sources of experienced support were scored on a scale from 1 (strongly disagree) to 5 (strongly agree).*

Other additional analyses also showed one statistically significant difference in experienced support of between different study phases (Table 5.3). The Games-Howell *post hoc* tests revealed that Master's students experienced significantly more support than Bachelor's 2/3 students by their family. Differences between study phases in other sources of support were not significant.

Table 5.3. ANOVA test results extent to which students experienced social support by various sources, broken down to study phase

	Study phase							
	Bachelor's 1 (a)		Bachelor's 2/3 (b)		Master's (c)			
Source of support	*M*	*SD*	*M*	*SD*	*M*	*SD*	(df_1, df_2)	*F*-test
Family (n=1877)	4.32	.92	4.22 [c]	.93	4.36 [b]	.83	(2,1874)	5.52**
Friends (n=1866)	4.05	.94	4.12	.83	4.17	.82	(2,1863)	1.80
Partner (n=1051)	4.27	.93	4.46	.86	4.48	.85	(2,1048)	1.44
Roommates (n=997)	3.62	1.06	3.69	1.08	3.69	1.07	(2,994)	.15
Fellow students (n=1785)	3.35	.99	3.50	.94	3.56	.97	(2,1782)	2.75
Lecturers (n=1804)	3.10	1.06	3.07	.97	3.16	1.03	(2,1801)	1.60
University's student counselors (n=1439)	3.05	1.02	3.00	1.08	2.99	1.10	(2,1436)	.13

***p < .01. Note. M = Mean, SD = Standard Deviation. All sources of experienced support were scored on a scale from 1 (strongly disagree) to 5 (strongly agree).*

Analyses also showed statistically significant differences in experienced support from some sources between schools (Table 5.4). Differences between schools were various and therefore not interpretable.

Table 5.4. ANOVA test results on extent to which students experienced social support by various sources of support, broken down to school

Source of support	School											
	TiSEM (a)		TLS (b)		TSB (c)		TSHD (d)		TST (e)			
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	(df_1, df_2)	*F*-test
Family (n=1842)	4.38 [b]	.81	4.20 [a]	.88	4.27	.88	4.23	1.01	3.92	1.22	(4,1837)	3.84**
Friends (n=1830)	4.16	.80	4.04	.85	4.18	.83	4.16	.87	4.00	.65	(4,1825)	1.75
Partner (n=1030)	4.45	.86	4.42	.86	4.51	.86	4.46	.87	4.27	1.22	(4,1025)	.52
Roommates (n=984))	3.81 [b d]	.98	3.48 [a]	1.05	3.71	1.06	3.53 [a]	1.22	3.69	1.44	(4,979)	3.70**
Fellow students (n=1748)	3.56	.94	3.44	1.01	3.51	.93	3.56	1.01	3.32	.85	(4,1743)	1.18
Lecturers (n=1765)	3.09	1.00	3.11	1.01	3.10	.94	3.15	1.08	3.48	.82	(4,1760)	1.05
University's student counselors (n=1412)	3.07	1.04	2.85 [e]	.106	3.01	1.08	2.95	1.17	3.58 [b]	1.06	(4,1407)	3.46**

***p < .01. Note. M = Mean, SD = Standard Deviation. All sources of experienced support were scored on a scale from 1 (strongly disagree) to 5 (strongly agree).*

We were also interested in whether the students experienced a change in experienced support compared to the period before the COVID-19-outbreak. As for all sources of support, the majority of students reported no change in experienced support (Figure 5.2). On average, the source that students experienced most 'positive' change in support were family, partner, and friends. The source that students experienced more 'negative' change in were: fellow students, lecturers, and university's student counselors (Table 5.5).

Figure 5.2. Change in experienced support compared to the period before the COVID-19-outbreak in percentages (n = 1893)

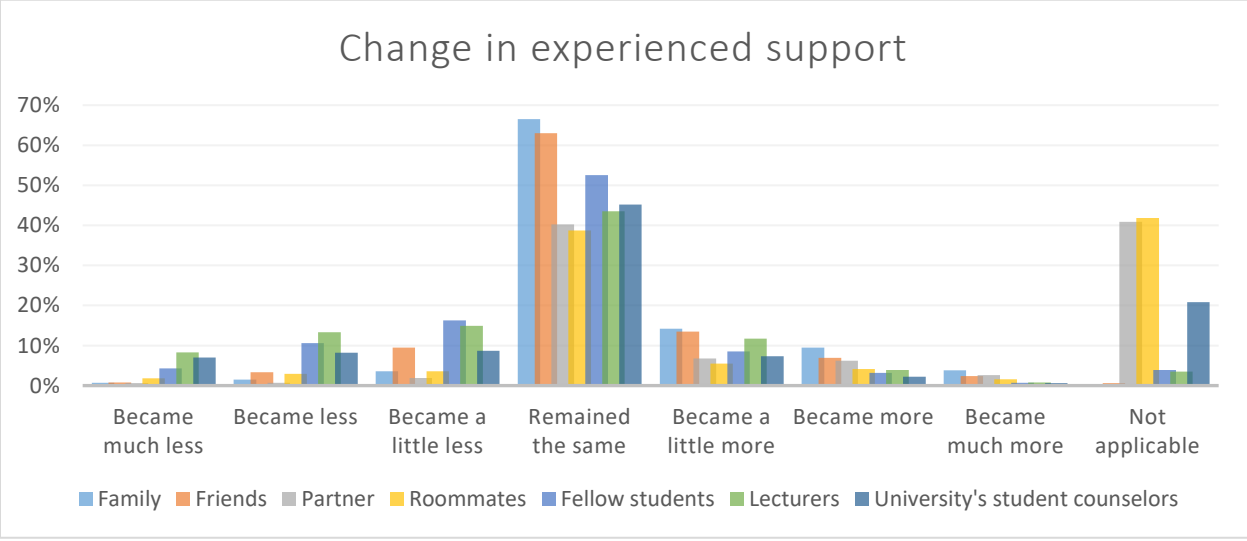


Table 5.5. Total scores on change in feeling supported by various sources

	M	*SD*
My family (*n* = 1889)	4.36	.95
My friends (*n* = 1881)	4.16	.95
My partner (*n* = 1118)	4.38	.98
My roommates (*n* = 1102)	4.06	1.08
My fellow students (*n* = 1819)	3.65	1.09
My lecturers (*n* = 1826)	3.54	1.28
The university's student counselors (*n* = 1499)	3.59	1.19

Note. M = Mean, SD = Standard Deviation. Change in experienced support was scored on a scale from 1 (became much less) to 7 (became much more).

Additional analyses showed statistically significant differences in change in experienced support of some sources between international and national students (Table 5.6). We found that international students experienced significantly more 'positive' change in support from family and friends than national students (Figure 5.3 and 5.4). We also found that national students experienced significantly more 'negative' change in support from fellow students, lecturers, and university's student counselors than international students (Figure 5.5, 5.6, and 5.7). Differences between national and international students in other sources of support were not significant.

Table 5.6. ANOVA test results on change in experienced support by various sources compared to before the COVID-19-period, broken down to national versus international students

	Group					
	National (a)		International (b)			
Source of support	*M*	*SD*	*M*	*SD*	(df_1, df_2)	*F*-test
Family (n=1889)	4.25 [b]	0.78	4.58 [a]	1.19	(1, 1887)	53.36***
Friends (n=1881)	4.10 [b]	.84	4.29 [a]	1.14	(1, 1879)	16.78***
Partner (n=1118)	4.35	.87	4.42	1.17	(1, 1116)	1.17
Roommates (n=1102)	4.07	.99	4.05	1.21	(1, 1100)	.07
Fellow students (n=1819)	3.62 [b]	1.06	3.73 [a]	1.14	(1, 1817)	3.91*
Lecturers (n=1826)	3.49 [b]	1.24	3.64 [a]	1.34	(1, 1824)	5.53*
University's student counselors (n=1499)	3.53 [b]	1.16	3.71 [a]	1.25	(1, 1497)	8.10**

**p < .05, **p < .01, ***p < .001. Note. M = Mean, SD = Standard Deviation. Change in experienced support was scored on a scale from 1 (became much less) to 7 (became much more).*

Figure 5.3. Change in feelings of support by family when comparing to the period before the COVID-19-outbreak in percentages, broken down to national versus international students (n = 1893)

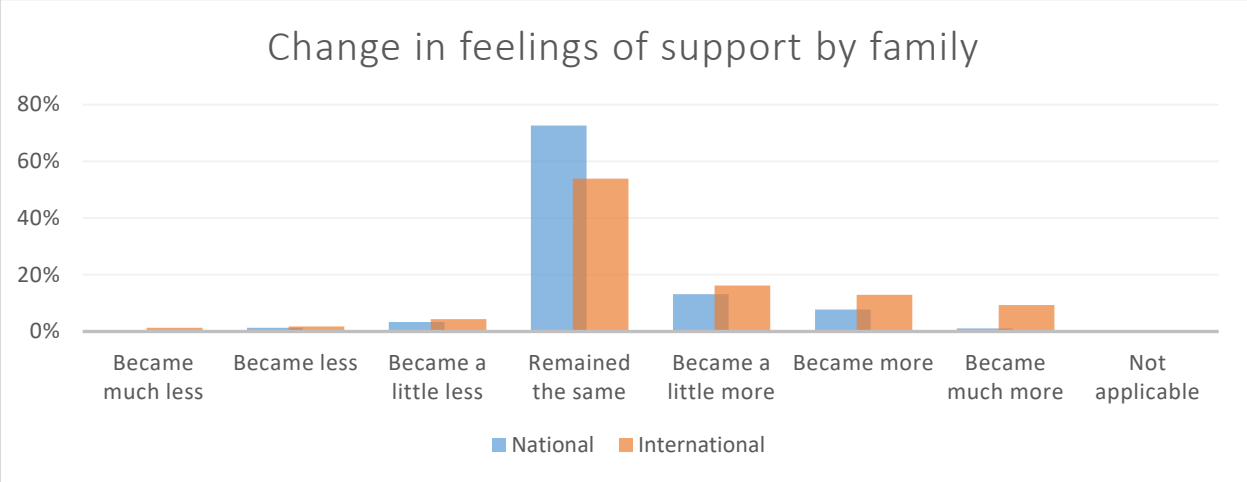


Figure 5.4. Change in feelings of support by friends when comparing to the period before the COVID-19-outbreak in percentages, broken down to national versus international students (n = 1893)

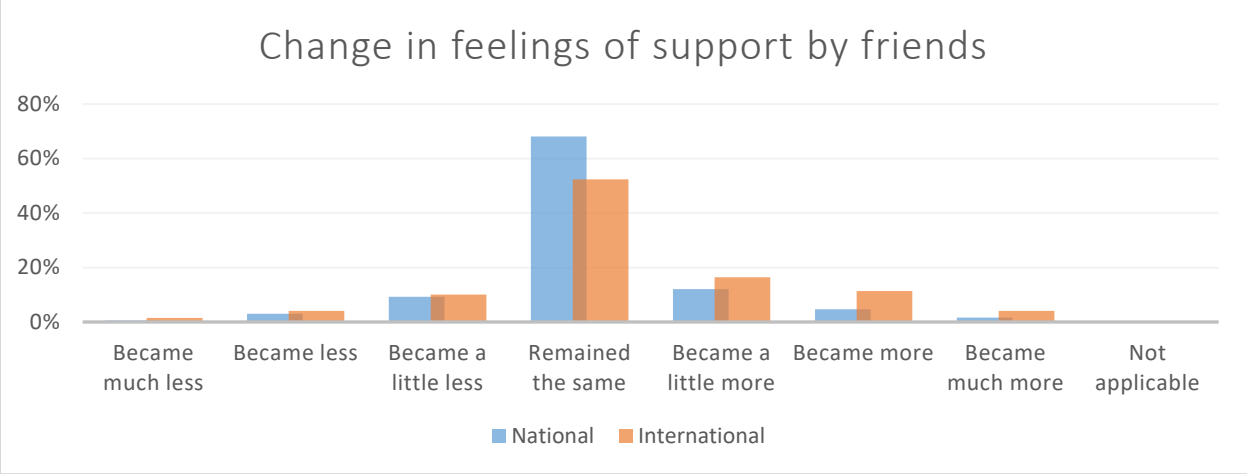


Figure 5.5. Change in feelings of support by fellow students when comparing to the period before the COVID-19-outbreak in percentages, broken down to national versus international students (n = 1893)

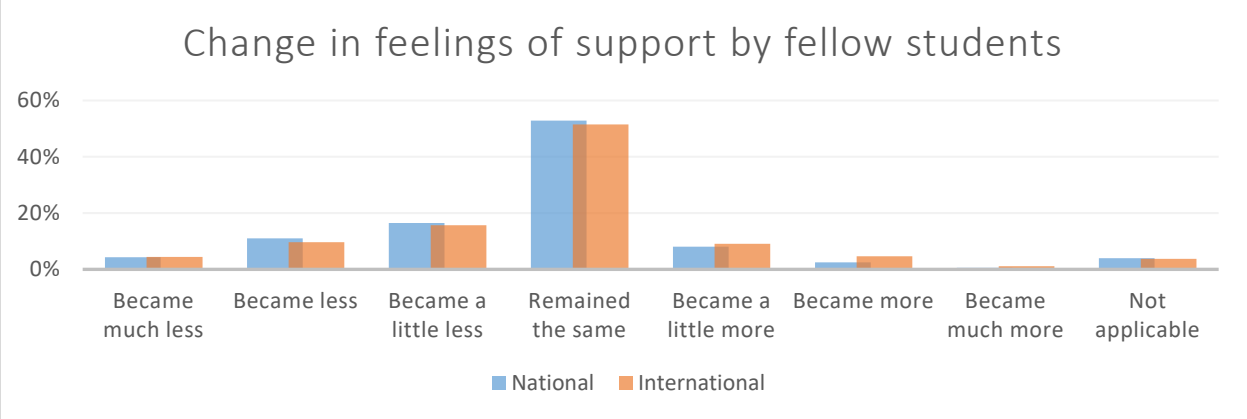


Figure 5.6. Change in feelings of support by lecturers when comparing to the period before the COVID-19-outbreak in percentages, broken down to national versus international students (n = 1893)

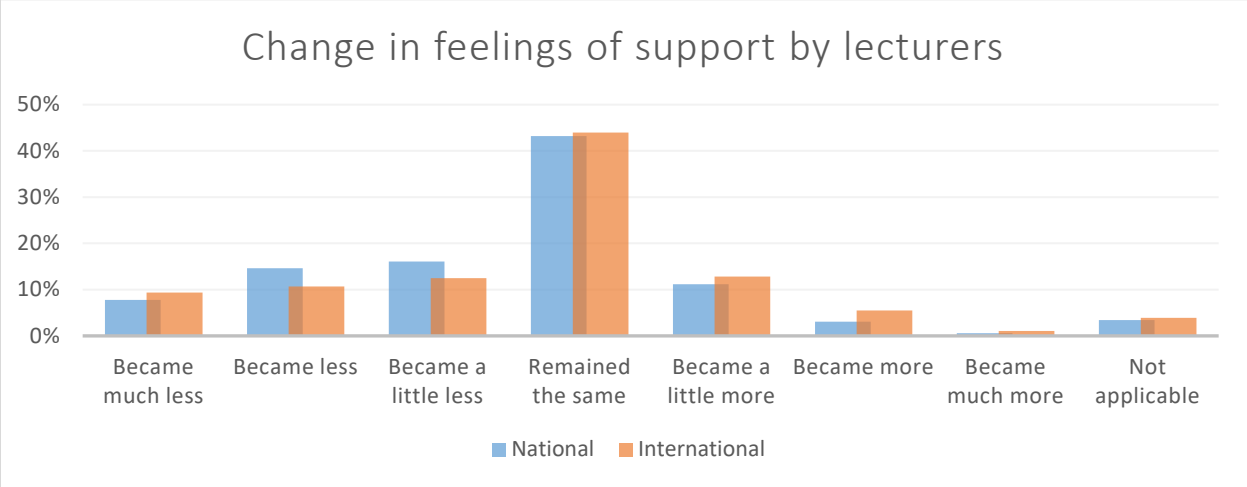
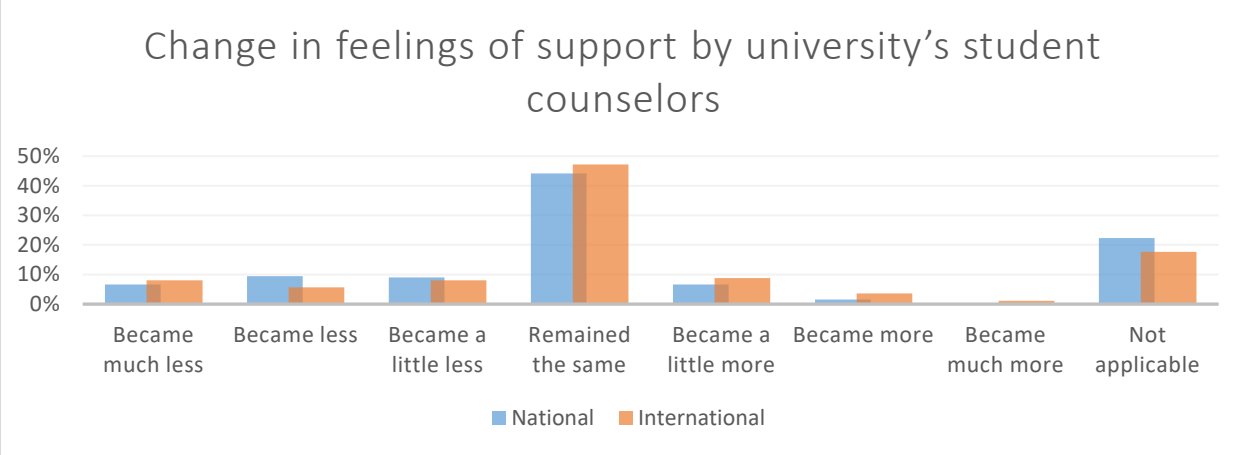


Figure 5.7. Change in feelings of support by university's student counselors when comparing to the period before the COVID-19-outbreak in percentages, broken down to national versus international students (n = 1893)



Other additional analyses showed statistically significant differences in change in experienced support from some sources between different study phases (Table 5.7). Games-Howell *post hoc* tests revealed that Master's students experienced significantly more 'positive' change in support from family than Bachelor's 2/3 students (Figure 5.8). In addition, Bachelor's 1 students experienced significantly more 'negative' change in support from fellow students than Master's students (Figure 5.9). Differences between study phases in other sources of support were not significant.

Table 5.7. ANOVA test results on change in experienced support by various sources compared to before the COVID-19-period, broken down to study phase

	Study phase							
	Bachelor's 1 (a)		Bachelor's 2/3 (b)		Master's (c)			
Source of support	*M*	*SD*	*M*	*SD*	*M*	*SD*	(df_1, df_2)	*F*-test
Family (n=1872)	4.47	.86	4.29 [c]	.92	4.41 [b]	.97	(2, 1869)	3.95*
Friends (n=1864)	4.00	1.07	4.14	.95	4.20	.94	(2, 1861)	2.78
Partner (n=1107)	4.37	1.13	4.41	.98	4.35	.98	(2, 1104)	.48
Roommates (n=1090)	3.86	1.27	4.01	1.13	4.15	.99	(2, 1087)	3.45
Fellow students (n=1803)	3.39 [c]	1.16	3.61	1.05	3.73 [a]	1.11	(2, 1800)	5.77**
Lecturers (n=1810)	3.33	1.30	3.48	1.26	3.60	1.27	(2, 1807)	3.43
University's student counselors (n=1487)	3.61	1.18	3.56	1.18	3.61	1.22	(2, 1484)	.42

**p < .05, **p < .01, ***p < .001. Note. M = Mean, SD = Standard Deviation. Change in experienced support was scored on a scale from 1 (became much less) to 7 (became much more).*

Figure 5.8. Change in feelings of support by family when comparing to the period before the COVID-19-outbreak in percentages, broken down to study phase (n = 1876)

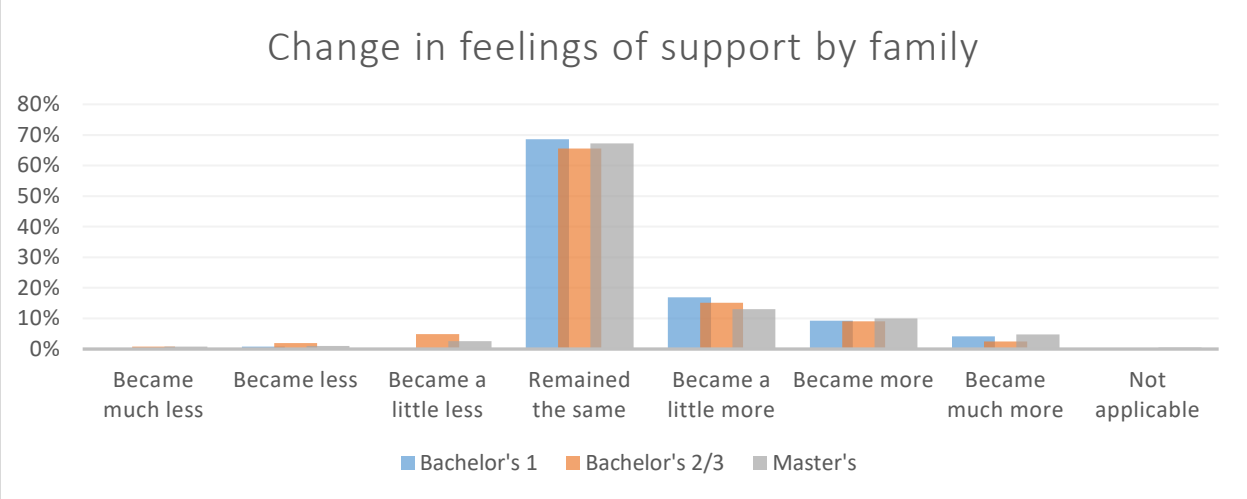
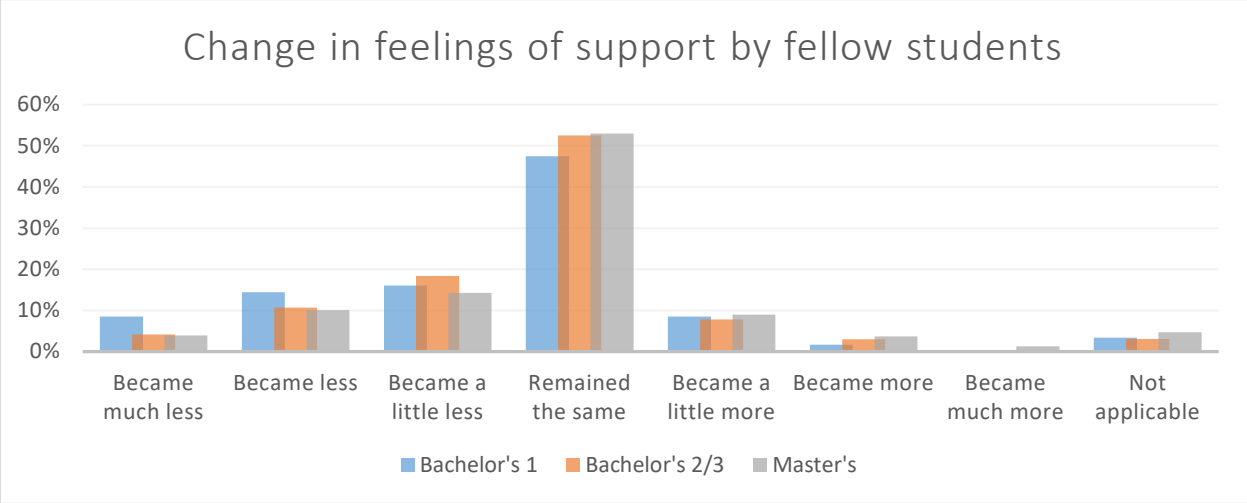


Figure 5.9. Change in feelings of support by fellow students when comparing to the period before the COVID-19-outbreak in percentages, broken down to study phase (n = 1876)



Finally, analyses showed no statistically significant differences in change in experienced support from some sources between different schools (Table 5.8).

Table 5.8. ANOVA test results on change in experienced support by various sources compared to before the COVID-19-period, broken down to school

	School											
	TiSEM (a)		TLS (b)		TSB (c)		TSHD (d)		TST (e)			
Source of support	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	(df_1, df_2)	*F*-test
Family (n=1836)	4.41	.88	4.28	.89	4.37	1.00	4.38	1.02	4.12	1.24	(4, 1831)	1.38
Friends (n=1828)	4.15	.86	4.14	.95	4.18	1.01	4.19	.99	3.96	1.10	(4, 1823)	.50
Partner (n=1085)	4.31	.87	4.38	1.02	4.40	1.05	4.47	1.00	4.41	1.46	(4, 1080)	.94
Roommates (n=1074)	4.03	.99	4.10	.99	4.08	1.22	4.06	1.08	3.81	1.11	(4, 1069)	.37
Fellow students (n=1768)	3.65	1.04	3.66	1.08	3.58	1.10	3.72	1.15	3.76	1.05	(4, 1763)	.93
Lecturers (n=1775)	3.50	1.17	3.65	1.29	3.44	1.28	3.52	1.38	3.96	1.21	(4, 1770)	2.11
University's student counselors (n=1462)	3.62	1.09	3.64	1.18	3.54	1.28	3.47	1.26	4.09	1.00	(4, 1457)	2.07

Note. M = Mean, SD = Standard Deviation. Change in experienced support was scored on a scale from 1 (became much less) to 7 (became much more).

Keypoints support by various sources

- Students feel most strongly supported by their family, friends, and partner. International students felt more supported by their family and lecturers than national students did.
- National student felt more supported by their partner and roommates than international students did. Moreover, Master's students felt more supported by their family than Bachelor's 2/3 students.
- On average, the source that students experienced most 'positive' change in support were family, partner, and friends. The source that students experienced more 'negative' change in were fellow students, lecturers, and university's student counselors.
- International students experienced more 'positive' change in support from family and friends than national students. National students experienced more 'negative' change in support from fellow students, lecturers, and university's student counselors than international students from fellow students, lecturers, and university's student counselors. Moreover, Master's students experienced more 'positive' change in support from family than Bachelor's 2/3 students. Bachelor's 1 students experienced more 'negative' change in support from fellow students than Master's students.

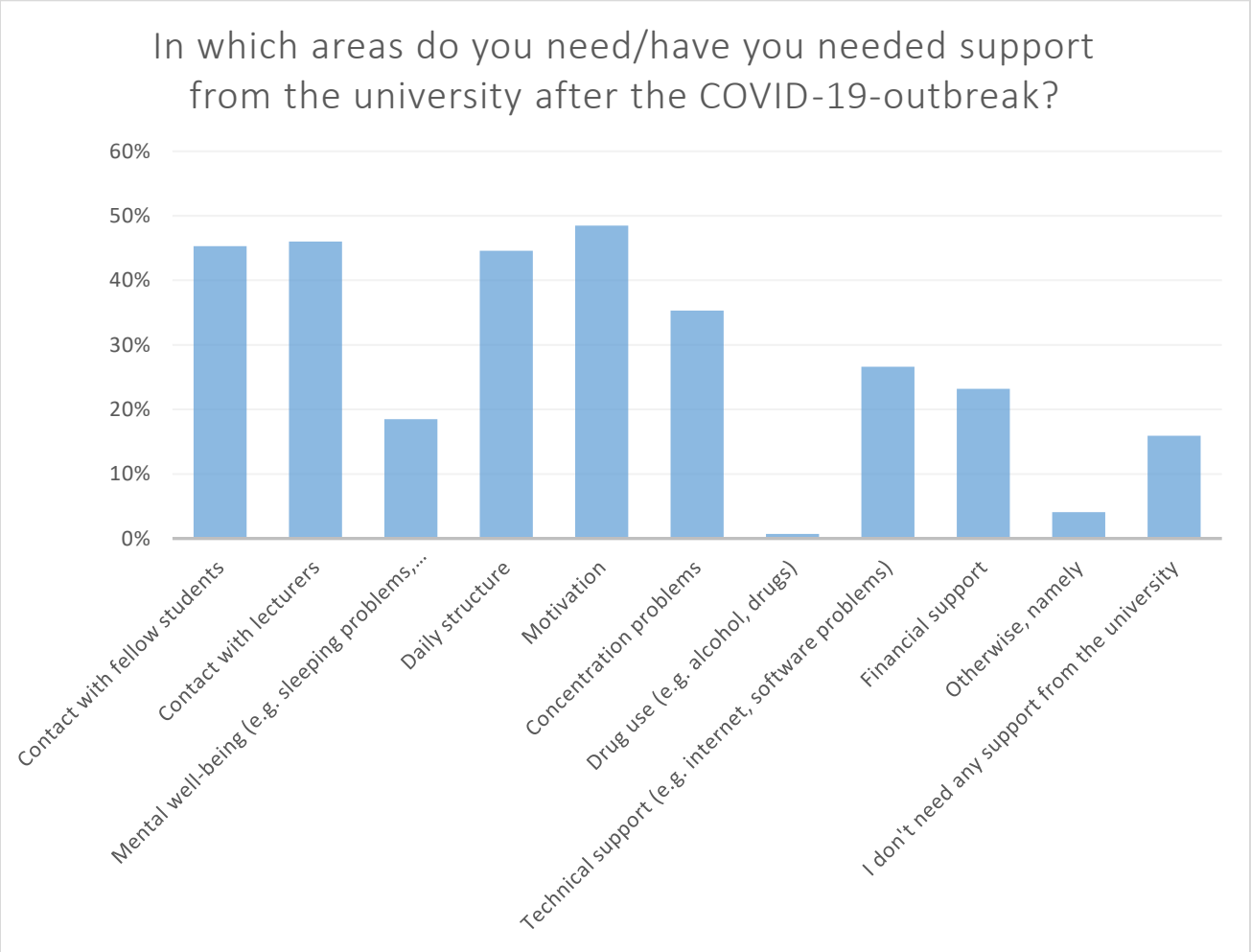
5.2. Support offered by university

We studied the experiences of students regarding possible support from the university, now that students were obligated to follow distance education and study from home.

Areas where students needed support

Students indicated in which areas they needed support from the university after the COVID-19 outbreak. Students mainly reported to need support in the areas of motivation (48.5%), contact with fellow students (45.3%), contact with lecturers (46.0%), and daily structure (44.6%). Students that reported other areas, reported to need support with a place to study, wanted more clear communication (about approach to the COVID-10-situation, study progress, exams, important dates etc.) and more flexibility regarding deadlines (Figure 5.10).

Figure 5.10. Reported areas where student needed support, in percentages of "yes"-answers (n = 1886)



Additional analyses showed some significant associations between the areas where students needed or had needed support and whether or not being an international student. National students seem **more** likely to need support in contact with fellow students and in daily structure than international students. In addition, international students seem to be **more** likely to need financial support and support in mental wellbeing than national students (Table 5.9).

Table 5.9. Chi-square test results on areas where students needed support in percentages of 'yes'-answers, broken down to national versus international students (n = 1886)

	Group		
Areas of needed support	National (a)	International (b)	χ-test
Contact with fellow students	49.6% [b]	36.5% [a]	28.79***
Contact with lecturers	45.7%	46.6%	0.14
Mental wellbeing (e.g. sleeping problems, anxiety, depression)	14.3% [b]	27.2% [a]	45.63***
Daily structure	46.6% [b]	40.6% [a]	6.17*
Motivation	47.1%	51.3%	2.94
Concentration problems	34.4%	37.3%	1.57
Drug use (e.g. alcohol, drugs)	0.6%	1.0%	NP
Technical support (e.g. internet, software problems)	25.4%	29.2%	3.00
Financial support	19.9% [b]	30.1% [a]	24.36***
I don't need any support from the university	15.8%	16.1%	.03
Otherwise	4.4%	3.6%	.70

**p < .05, ***p < .001. Note. NP = not possible, due to not meeting test assumptions. Df (1).*

Additional analyses also showed significant associations between areas where students needed or had needed support and different study phases. Master's students seem to be **more** likely than Bachelor's 2/3 students to need support in contact with fellow students and lecturers. In addition, Bachelor's 1 and Bachelor's 2/3 students seem to be **more** likely to need support in daily structure than Master's students (Table 5.10).

Table 5.10. Chi-square test results on areas where students needed support in percentages of 'yes'-answers, broken down to study phase (n = 1869)

	Study phase			
Areas of needed support	Bachelor's 1 (a)	Bachelor's 2/3 (b)	Master's (c)	χ-test
Contact with fellow students	39.3%	43.4% [c]	48.3% [b]	6.10*
Contact with lecturers	42.7%	43.2% [c]	49.3% [b]	7.02*
Mental wellbeing (e.g. sleeping problems, anxiety, depression)	19.7%	17.9%	18.4%	.24
Daily structure	52.1% [c]	49.2% [c]	38.8% [b]	22.21**
Motivation	49.6%	50.9%	45.5%	5.22
Concentration problems	41.9%	36.6%	33.2%	4.51
Drug use (e.g. alcohol, drugs)	0.0%	0.8%	0.7%	NP
Technical support (e.g. internet, software problems)	23.1%	26.5%	27.0%	.80
Financial support	21.4%	22.5%	23.7%	.55
I don't need any support from the university	18.8%	15.3%	16.2%	1.02
Otherwise	18.8%	15.3%	16.2%	1.02

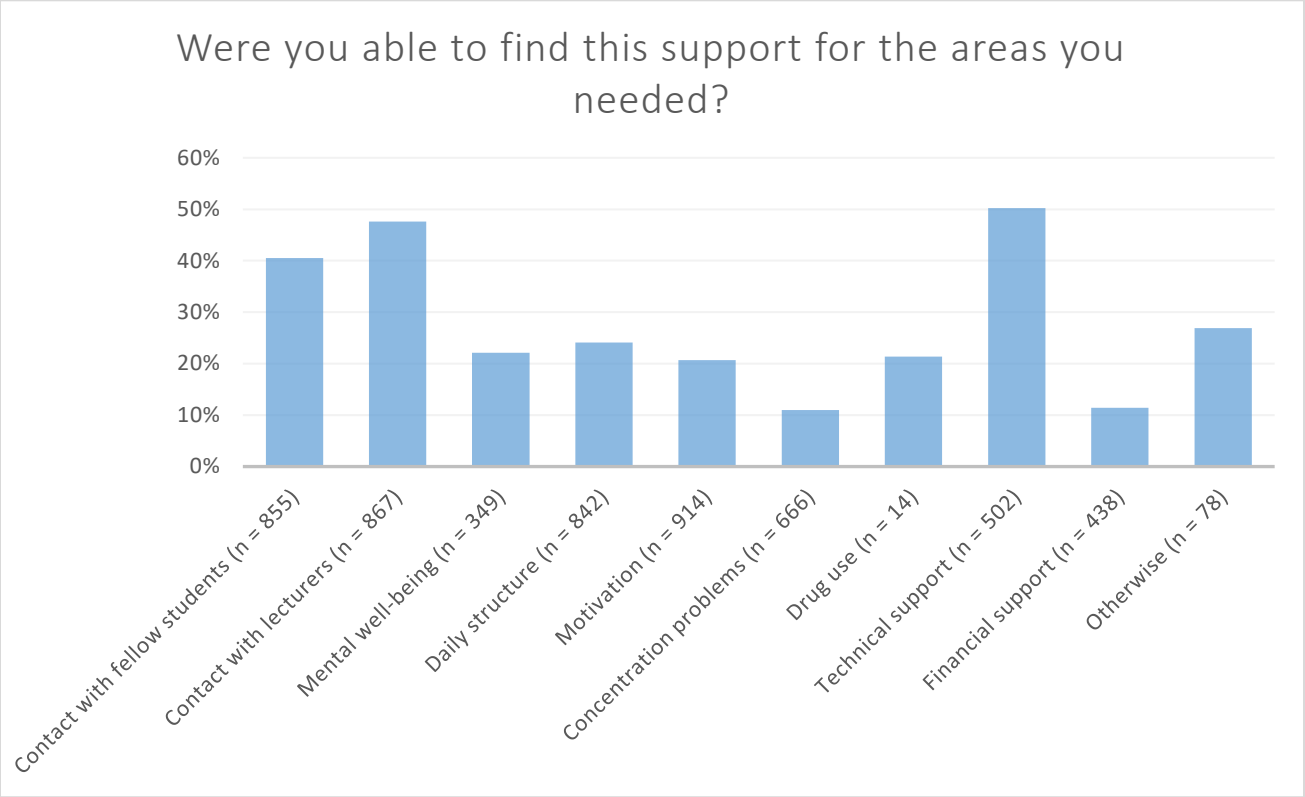
**p < .05, **p < .001. Note. NP = not possible, due to not meeting test assumptions. Df (2).*

Finally, additional analyses showed some significant associations between areas where students needed or had needed support and different schools, but differences between schools were various and therefore not interpretable.

Successfully finding the needed support

For the areas in which students indicated a need for support, students were asked whether they had found this support. Only to the area of technical support, a small majority reported they had found this support (50.2%). In all other areas, the majority of the students indicated that they have not found the needed support. Support in more psychological levels (i.e. mental wellbeing, daily structure, motivation, concentration problems, drug use) and financial support was often not found by students (Figure 5.11).

Figure 5.11. Areas where students found the needed support, in percentages of "yes"-answers



Additional analyses showed significant associations in what areas students had found the needed support and whether or not being an international student. International students were **more** likely than national students to have found the support they needed in contact with fellow students, contact with lecturers, motivation, concentration problems, technical support and financial support (Table 5.11).

Table 5.11. Chi-square test results on areas where students have found support in percentages of 'yes'-answers, broken down to national versus international students

	Group		
Areas of needed support	National (a)	International (b)	χ-test
Contact with fellow students (*n* = 855)	37.1% [b]	50.0% [a]	11.45**
Contact with lecturers (*n* = 867)	40.3% [b]	62.6% [a]	38.25***
Mental wellbeing (e.g. sleeping problems, anxiety, depression) (*n* = 349)	19.8%	24.6%	1.15
Daily structure (*n* = 842)	22.4%	28.1%	3.10
Motivation (*n* = 914)	17.5% [b]	26.7%*	10.51**
Concentration problems (*n* = 666)	7.8% [b]	17.0% [a]	13.17***
Drug use (e.g. alcohol, drugs) (*n* =14)	0.0%	50.0%	NP
Technical support (e.g. internet, software problems) (*n* = 502)	44.0% [b]	61.5% [a]	14.09***
Financial support (*n* = 438)	6.3% [b]	18.4% [a]	15.36***
Otherwise (*n* = 78)	25.0%	31.8%	.37

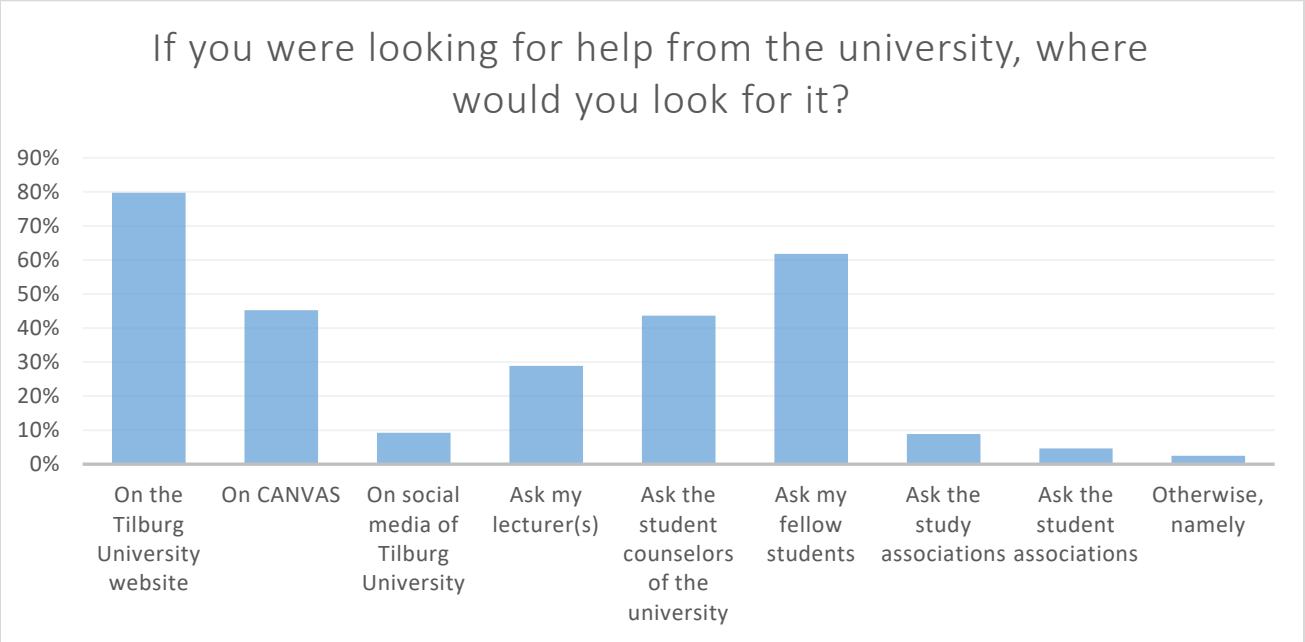
***p < .01, ***p < .001. Note. NP = not possible, due to not meeting test assumptions. Df (1).*

Other additional analyses showed no significant associations between areas where students needed or had needed support and different study phases. Finally, additional analyses showed no significant associations between areas where students needed or had needed support and different schools.

Places where students search for support

The majority of students reported they would search for information on the website of Tilburg University (79.7%) and via fellow students (61.8%). Students that reported to search for support in other places, reported they would look for support by Student Desk, Library Support, WhatsApp group chats, OSIRIS, Google, friends or family, and some indicated they would not know where to look (Figure 5.12).

Figure 5.12. Places where student would search for support, in percentages of "yes"-answers (n = 1884)



Additional analyses also showed significant associations between places students would look for support and whether or not being an international student. National students seem **more** likely than international students to search for support on the Tilburg University website and by asking study associations. International students seem **more** likely than national students to search for support on social media of Tilburg University, by asking their lecturer(s), or in other places (Table 5.13)

Table 5.12. Chi-square test results on places where students would search for support in percentages of 'yes'-answers, broken down to national versus international students (n = 1884)

	Group		
Places students would search for support	National (a)	International (b)	χ-test
On the Tilburg University website	80.6%	77.7%	2.29
On CANVAS	47.0% [b]	41.4% [a]	5.12*
On social media of Tilburg University	7.1% [b]	13.7% [a]	21.63***
Ask my lecturer(s)	25.8% [b]	35.4% [a]	18.51***
Ask the student counselor(s) of the university	44.6%	41.6%	1.53
Ask my fellow students	60.9%	63.8%	1.46
Ask the study associations	10.5% [b]	5.4% [a]	13.63***
Ask the student associations	3.9%	5.9%	3.57
Otherwise	1.8% [b]	3.9% [a]	7.54**

**p < .05, **p < .01, ***p < .001. Note. Df (1).*

Additional analyses also showed significant associations between places students would look for support and different study phases. Master's students seem **more** likely than Bachelor's 2/3 students to search for support by asking their lecturer(s) and by asking their fellow students. In addition, Bachelor's 1 and Bachelor's 2/3 students seem **more** likely than Master's students to search for support by asking the student counselor(s) of the university (Figure 5.14).

Table 5.13. Chi-square test results on places where students would search for support in percentages of 'yes'-answers, broken down to study phase (n = 1867)

	Study phase			
Places students would search for support	Bachelor's 1 (a)	Bachelor's 2/3 (b)	Master's (c)	χ-test
On the Tilburg University website	82.8%	79.1%	79.9%	.86
On CANVAS	49.1%	44.9%	44.9%	.79
On social media of Tilburg University	6.0%	8.7%	10.2%	2.68
Ask my lecturer(s)	34.5%	24.5% [c]	32.9% [b]	16.85***
Ask the student counselor(s) of the university	54.3% [c]	46.3% [c]	39.4% [a b]	14.45**
Ask my fellow students	59.5%	65.2% [c]	59.1% [b]	7.07*
Ask the study associations	7.8%	10.3%	7.5%	4.25
Ask the student associations	4.3%	5.2%	4.1%	1.31
Otherwise	2.6%	2.5%	2.4%	.01

**p < .05, **p < .01, ***p < .001. Note. Df (2).*

Finally, additional analyses showed some significant associations between places students would look for support and different schools, but differences between schools were various and therefore not interpretable.

Keypoints support offered by university

- Students mainly reported to need support in the areas of motivation (48.5%), contact with fellow students (45.3%), contact with teachers (46.0%), and daily structure (44.6%). National students seem **more** likely than international students to need support in contact with fellow students and in daily structure. In addition, international students seem to be **more** likely than national students to need financial support and support in mental wellbeing. Moreover, Master's students seem to be **more** likely than Bachelor's 2/3 students to need support in contact with fellow students and lecturers. In addition, Bachelor's 1 and Bachelor's 2/3 students seem to be **more** likely to need support in daily structure than Master's students. Finally, some significant associations were found between different schools, but those were various and therefore not interpretable.

- For most areas that students needed support for, the majority of students reported that they had not found the needed support. Support in more psychological levels (i.e. mental wellbeing, daily structure, motivation, concentration problems, drug use) and financial support was most often not found. International students were **more** likely than national students to have found the support they needed in contact with fellow students, contact with lecturers, motivation, concentration problems, technical support and financial support.

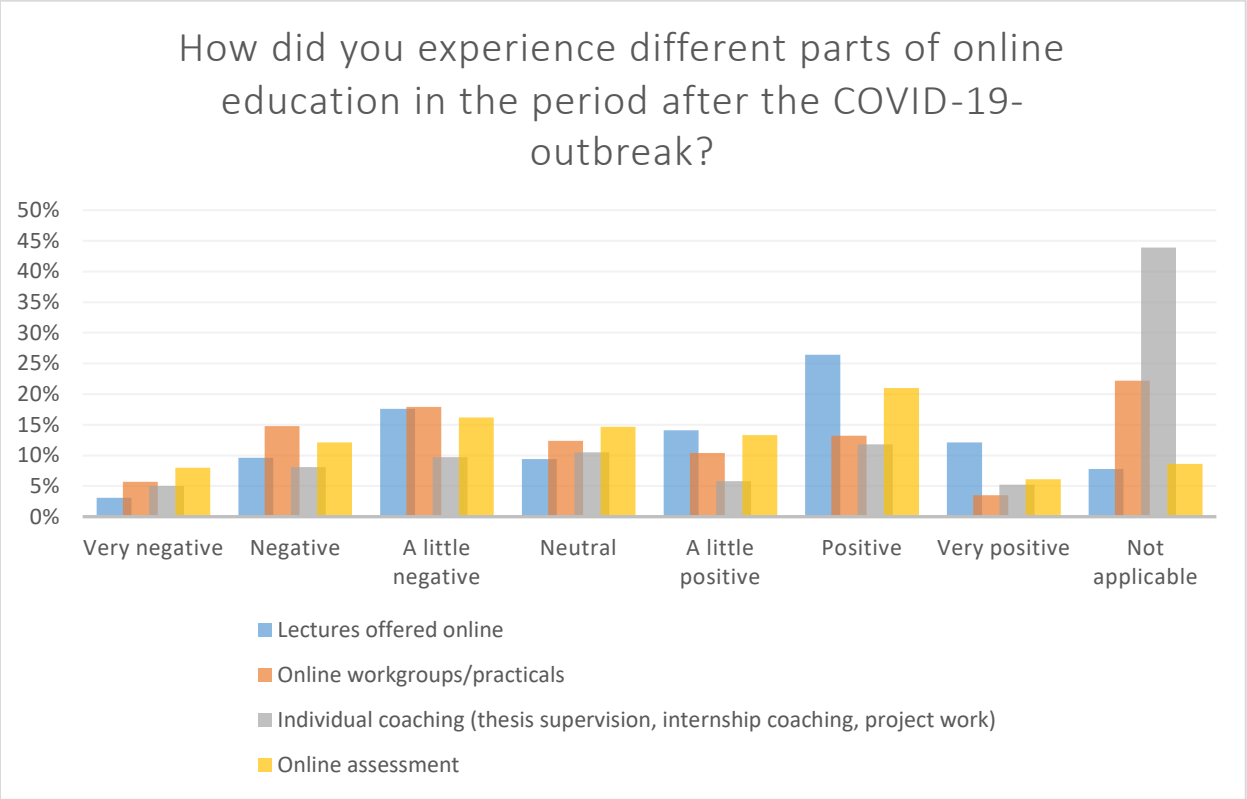
- The majority of students reported they would search for information on the website of Tilburg University (79.7%) and via fellow students (61.8%). National students seem **more** likely than international students to search for support on the Tilburg University website and by asking study associations. International students seem **more** likely than national students to search for support on social media of Tilburg University, by asking their lecturer(s), or in other places. Master's students seem **more** likely than Bachelor's 2/3 students to search for support by asking their lecturer(s) and by asking their fellow students. In addition, Bachelor's 1 and Bachelor's 2/3 students seem **more** likely than Master's students to search for support by asking the student counselor(s) of the university. Finally, some significant associations were found between different schools, but those were various and therefore not interpretable.

6. Experiences with distance education

6.1. Experiences with different parts of online education

We studied how students had experienced the digital education during the COVID-19-period, distinguishing between lectures offered online, online workgroups/practicals, individual coaching, and online assessment. Most students appear to be positive about the online lectures offered in particular (52.6%; 57.0% without the 'not applicable'-category). For all other components, student responses vary widely, with a significant portion being negative and a significant portion being positive (Figure 6.1).

Figure 6.1. Experiences with digital education forms in percentages (n = 1882)



On average, students reported a score between 'neutral' and 'a little positive' for online lectures, individual coaching, and online assessment. Students reported a score between 'a little negative' and 'neutral' for online workgroups/practicals (Table 6.1).

Table 6.1. Experiences with digital education

	M	*SD*
Lectures offered online (*n* = 1736)	4.62	1.73
Online workgroups/practicals (*n* = 1464)	3.77	1.68
Individual coaching (thesis supervision, internship coaching, project work) (*n* = 1056)	4.07	1.82
Online assessment (*n* = 1720)	4.10	1.77

Note. M = Mean, SD = Standard Deviation. All online education forms were scored on a scale from 1 (very negative) to 7 (very positive).

Additional analyses showed there were some statistically significant differences in evaluations of the digital education between international and national students, *Wilks' Lambda* = .962, *F* (4, 757) = 7.58, *p* < .001. We found that national students experienced the online lectures more positive than international students (Table 6.2).

Table 6.2. MANOVA test results on evaluations on forms of digital education, broken down to national versus international students (n = 762)

	Group				
	National (a)		International (b)		
Form of digital education	*M*	*SD*	*M*	*SD*	*F*-test
Online lectures	4.75 [b]	1.74	4.15 [a]	1.87	21.07***
Online workgroups/practicals	3.80	1.73	3.55	1.68	3.87
Individual coaching	3.87	1.80	3.90	1.77	.07
Online assessment	4.09	1.81	4.03	1.77	.21

**** p < .001. Note. M = Mean, SD = Standard Deviation. All online education forms were scored on a scale from 1 (very negative) to 7 (very positive).*

Moreover, additional analyses showed there were some statistically significant differences in evaluations of the digital education between different study phases, *Wilks' Lambda* = .972, *F* (8, 1498) = 2.72, *p* < .01. The Games-Howell *post hoc test* revealed that Master's students experienced individual coaching as more positive than Bachelor's 2/3 students (Table 6.3).

Table 6.3. MANOVA test results on evaluations on forms of digital education, broken down to study phase (n = 762)

	Study phase						
	Bachelor's 1 (a)		Bachelor's 2/3 (b)		Master's (c)		
Form of digital education	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*-test
Online lectures	4.35	1.75	4.44	1.81	4.60	1.83	.87
Online workgroups/practicals	3.49	1.73	3.55	1.72	3.85	1.71	3.01
Individual coaching	3.62	1.42	3.63 [c]	1.71	4.14 [b]	1.85	8.02***
Online assessment	3.92	1.71	4.08	1.79	4.05	1.82	.14

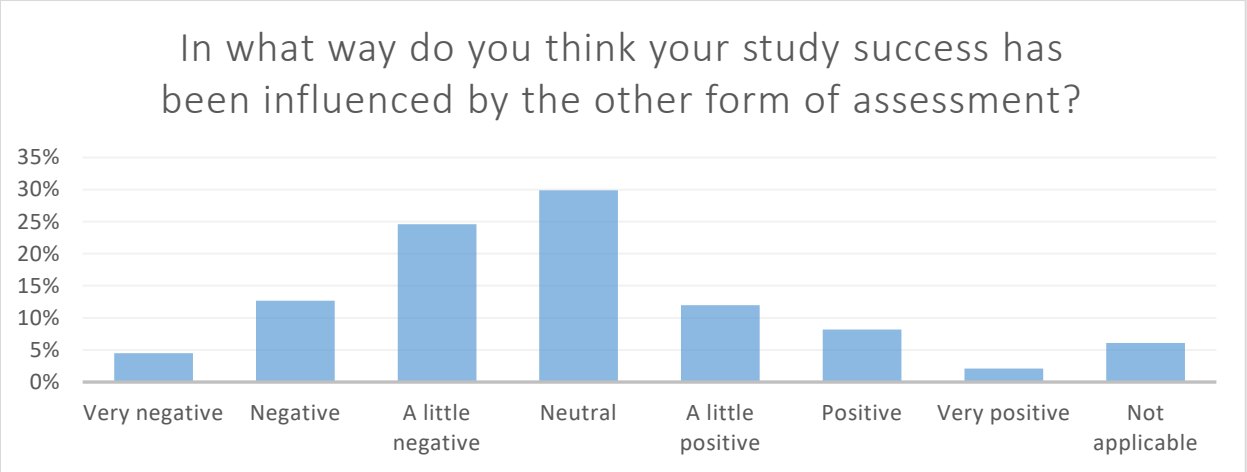
**** p < .001. Note. M = Mean, SD = Standard Deviation. All online education forms were scored on a scale from 1 (very negative) to 7 (very positive).*

Finally, additional analyses showed there were some statistically significant differences in evaluations of the digital education between different schools, *Wilks' Lambda* = .958, *F* (16, 2234) = .96, *p* < .05 (Table 6.3). However, differences between different schools were too small to be revealed by Games Howell *post hoc* tests

6.2. Perceived effect other assessment form on study success

The largest group of students (29.9%) reported that their study success had not been influenced by the other form of assessment, followed by 24.6% that reported that it had a little negative influence on their study success (Figure 6.2). On average, the perceived effect of other assessment forms on study success was 3.70 (*SD* = 1.35), which represents a score between 'a little negative' and 'neutral'.

Figure 6.2. Perceived effect of other assessment form on study success in percentages (n = 1880)



Additional analyses showed no significant effect of whether or not being an international student on perceived effect of other assessment form on study success, $F(1, 1764) = 2.22$, $p > .05$. Additional analyses showed also no significant effect of study phase on perceived effect of other assessment form on study success, $F(2, 1748) = 2.98$, $p > .05$. Finally, additional analyses did show a significant effect of school on perceived effect of other assessment form on study success (Table 5.8). The Games-Howell *post hoc* test revealed that TSHD, TSB, and TiSEM students thought significantly more negative about the influence of the other assessment form on their study success than TLS students.

Table 6.3. ANOVA test results on perceived influence of other form of assessment on study success, broken down to school (n = 1720)

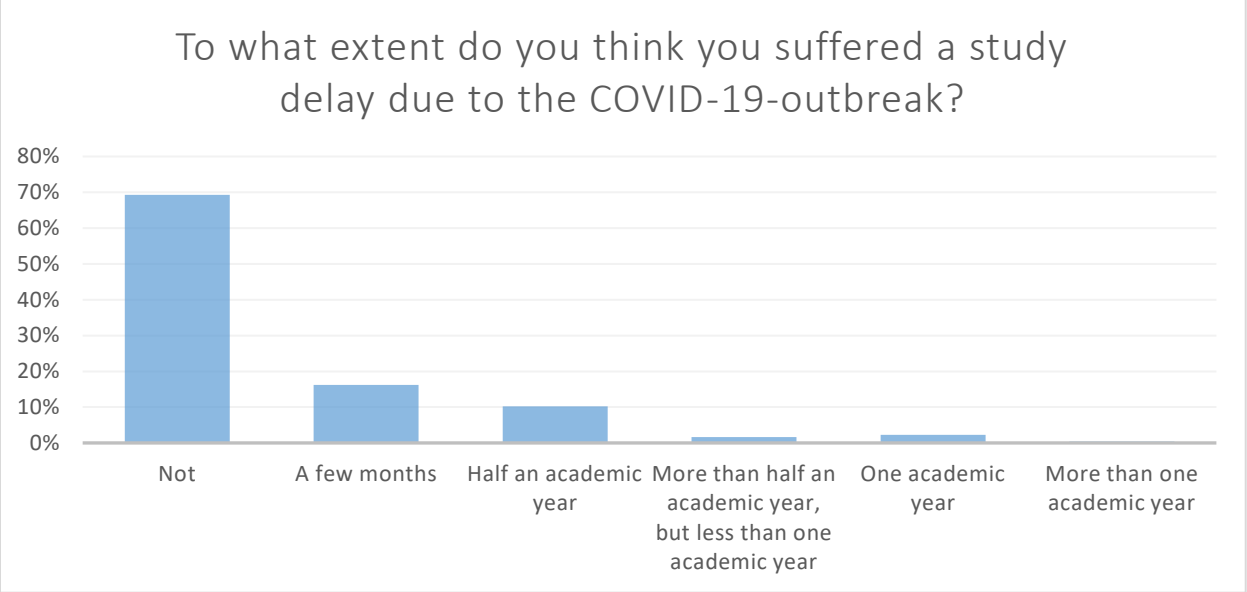
	School										
	TiSEM (a)		TLS (b)		TSB (c)		TSHD (d)		TST (e)		
Perceived influence	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*-test
On study success	3.60 [b]	1.26	4.01 [a c d]	1.37	3.64 [b]	1.44	3.54 [b]	1.27	3.92	1.44	6.47***

**** p < .001. Note. M = Mean, SD = Standard Deviation. Perceived influence on study success was scored on a scale from 1 (very negative) to 7 (very positive). Df(4, 1715).*

6.3. Perceived effect COVID-19-outbreak on study delay

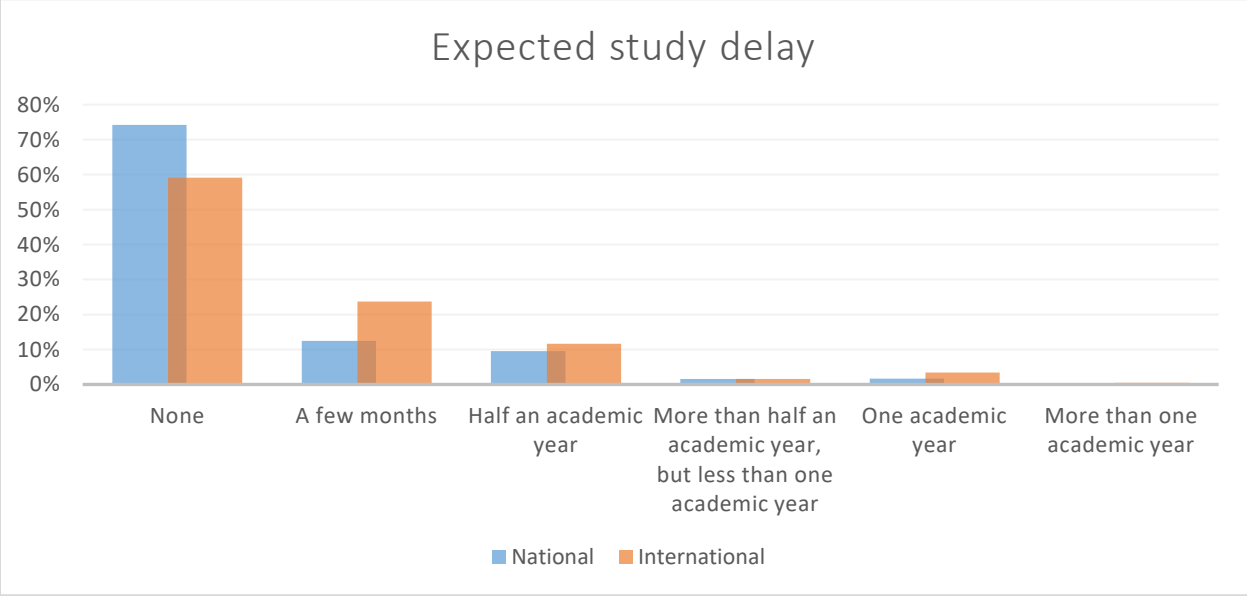
The majority of students (69.3%) did not think that the COVID-19 outbreak caused a study delay (Figure 6.3). In general, with each category of potential longer study delay, the percentage of students that reported this category decreased.

Figure 6.3. Perceived effect of COVID-19-outbreak on study delay in percentages (n = 1880)



Additional analyses showed significant associations between the amount of study delay that students expected and whether or not being an international student. National students seem **more** likely than international students to think the COVID-19-outbreak caused no study delay at all. International students seem **more** likely than national students to think the COVID-19-outbreak caused a study delay of a few months and a study delay of one academic year (Figure 6.4). Other analyses to study associations between the amount of study delay and different study phases and schools were not possible because test assumptions were not met.

Figure 6.1. Perceived effect of COVID-19-outbreak on study delay, broken down to national versus international students (n = 1880)



Keypoints experiences with distance education

- Most students appear to be positive about the online lectures offered in particular. For all other components, student responses vary widely, with a significant portion being negative and a significant portion being positive. On average, students reported a score between ‘neutral’ and ‘a little positive’ for online lectures, individual coaching, and online assessment. Students reported a score between ‘a little negative’ and ‘neutral’ for online workgroups/practicals. National students experienced the online lectures more positive than international students. Furthermore, Master’s students experienced individual coaching as more positive than Bachelor’s 2/3 students.

- The largest group of students (29.9%) reported that their study success had not been influenced by the other form of assessment. On average, the perceived effect of other assessment forms on study success was between ‘a little negative’ and ‘neutral’. TSHS, TSB, and TiSEM students thought significantly more negative about the influence of the other assessment form on their study success than TLS students.

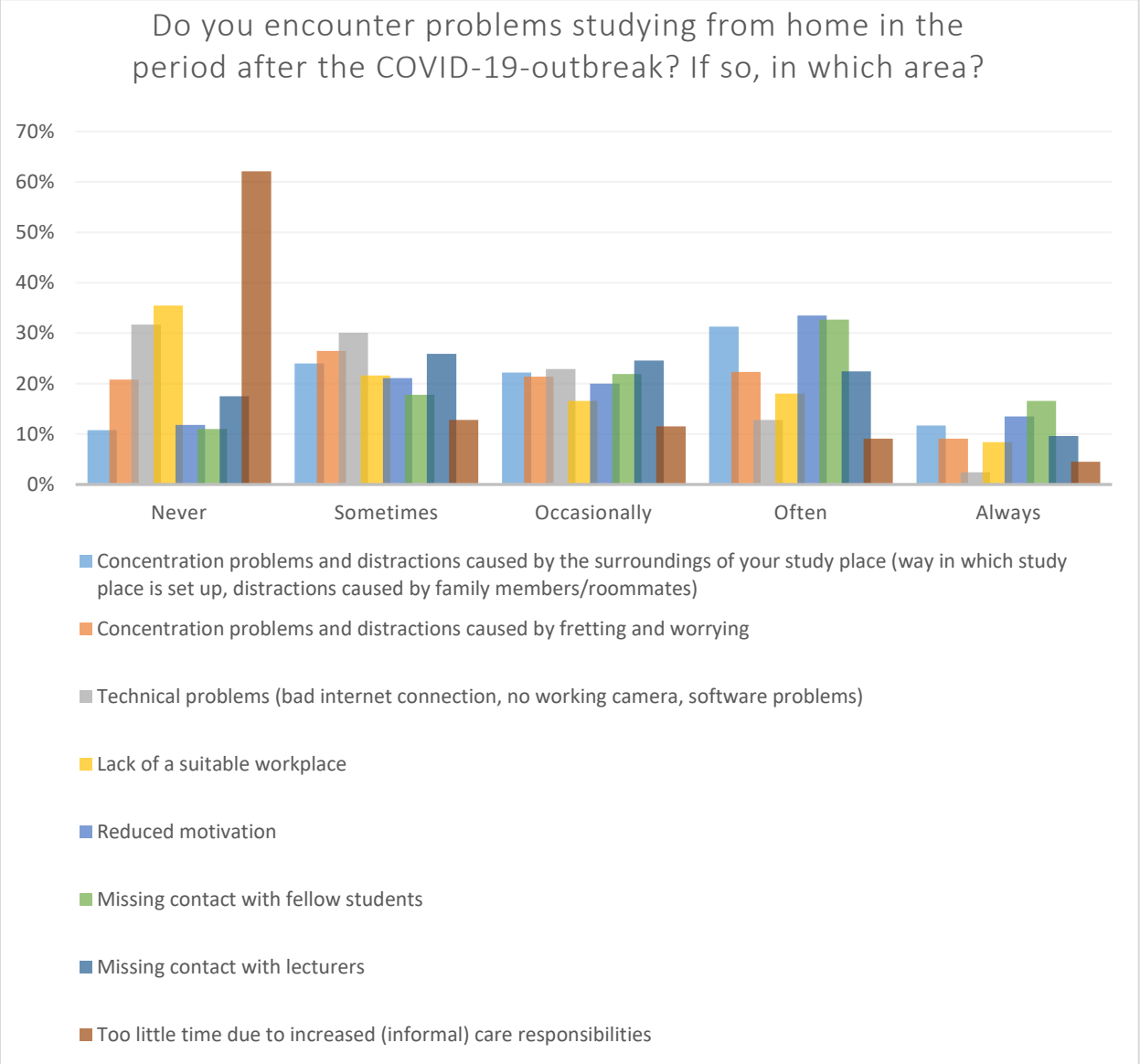
- The majority of students (69.3%) did not think that the COVID-19 outbreak caused a study delay. National students seem more likely than international students to think the COVID-19-outbreak caused no study delay at all.

7. Studying from home

7.1. Problems with studying from home

We studied whether students had encountered problems studying from home in the period after the COVID-19-outbreak. With the exception of "too little time due to increased (mantle) care tasks", most students encountered problems in all areas at least sometimes. For some problems, a large group of students indicated run into these often or always, including missing contact with fellow students (49.3%), reduced motivation (47.0%), and concentration problems and distraction due to the environment of the study place (43.0%) (Figure 7.1).

Figure 7.1. Problems with studying from home in percentages (n = 1878)



On average, students reported to occasionally to often have encountered problems regarding missing contact with fellow students, reduced motivation, and concentration problems and distractions caused by the surroundings of their study place (Table 7.1)

Table 7.1. Total score of frequency of encountered problems (n = 1981)

	M	*SD*
Concentration problems and distractions caused by the surroundings of your study place (way in which study place is set up, distractions caused by family members/roommates)	3.09	1.20
Concentration problems and distractions caused by fretting and worrying	2.72	1.27
Technical problems (bad internet connection, no working camera, software problems)	2.24	1.10
Lack of a suitable workplace	2.42	1.35
Reduced motivation	3.16	1.24
Missing contact with fellow students	3.26	1.24
Missing contact with lecturers	2.81	1.24
Too little time due to increased (informal) care responsibilities	1.81	1.21

Note. M = Mean, SD = Standard Deviation. All encountered problems were scored on a scale from 1 (never) to 5 (always).

Additional analyses showed there were some statistically significant differences in the extent to which students encountered problems with studying from home between international and national students, *Wilks' Lambda* = .771, $F(8, 1869) = 69.53$, $p < .001$. Overall, all significant differences indicated that international students experience all mentioned problems with studying from home more often than national students, with exception from problems related to missing contact with fellow students, where we found no significant difference (Table 7.2).

Table 7.2. MANOVA test results on encountered problems with studying from home, broken down to national versus international students (n = 1861)

	Group				
	National (a)		International (b)		
Encountered problems	*M*	*SD*	*M*	*SD*	*F*-test
Concentration problems and distractions caused by the surroundings of your study place (way in which study place is set up, distractions caused by family members/roommates)	3.04 [b]	1.18	3.20 [a]	1.25	7.19**
Concentration problems and distractions caused by fretting and worrying	2.60 [b]	1.23	2.99 [a]	1.30	40.55***
Technical problems (bad internet connection, no working camera, software problems)	2.20 [b]	1.08	2.32 [a]	1.15	5.12*
Lack of a suitable workplace	2.33 [b]	1.30	2.61 [a]	1.44	17.28***
Reduced motivation	3.05 [b]	1.22	3.39 [a]	1.24	32.08***
Missing contact with fellow students	3.24	1.21	3.30	1.31	1.11
Missing contact with lecturers	2.69 [b]	1.18	3.05 [a]	1.33	36.18***
Too little time due to increased (informal) care responsibilities	1.42 [b]	.90	2.61 [a]	1.36	505.22***

**p < .05, **p < .01, *** p < .001. Note. M = Mean, SD = Standard Deviation. All encountered problems were scored on a scale from 1 (never) to 5 (always). Df (1, 1876)*

Moreover, additional analyses showed there were some statistically significant differences in the extent to which students encountered problems with studying from home between different study phases, *Wilks' Lambda* = .959, $F(16, 3702) = 4.92$, $p < .001$. The Games-Howell *post hoc* test revealed that Master's students experienced technical problems and problems related to a lack of a suitable workplace more often than Bachelor's 2/3 students. In addition, we found that Bachelor's 1 students experienced problems related to reduced motivation more often than Master's students. We also found that Bachelor's 1 and Master's students experienced problems related to missing contact with lecturers more often than Bachelor's 2/3 students (Table 7.3)

Table 7.3. MANOVA test results on encountered problems with studying from home, broken down to study phase (n = 1861)

	Study phase						
	Bachelor's 1 (a)		Bachelor's 2/3 (b)		Master's (c)		
Encountered problems	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*-test
Concentration problems and distractions caused by the surroundings of your study place (way in which study place is set up, distractions caused by family members/roommates)	3.24	1.16	3.04	1.20	3.12	1.21	1.94
Concentration problems and distractions caused by fretting and worrying	2.71	1.29	2.68	1.29	2.78	1.24	1.32
Technical problems (bad internet connection, no working camera, software problems)	2.19	1.05	2.17 [c]	1.06	2.31 [b]	1.15	3.86*
Lack of a suitable workplace	2.47	1.42	2.25 [c]	1.31	2.60 [b]	1.36	15.02***
Reduced motivation	3.43 [c]	1.25	3.17	1.24	3.10 [a]	1.23	3.82*
Missing contact with fellow students	3.43	1.25	3.21	1.24	3.29	1.24	1.89
Missing contact with lecturers	3.07 [b]	1.30	2.70 [a c]	1.23	2.88 [b]	1.22	7.12**
Too little time due to increased (informal) care responsibilities	2.03	1.26	1.81	1.20	1.78	1.22	2.22

**p < .05, **p < .01, *** p < .001. Note. M = Mean, SD = Standard Deviation. All encountered problems were scored on a scale from 1 (never) to 5 (always). Df (2, 1858)*

Finally, additional analyses showed there were some statistically significant differences in the extent to which students encountered problems with studying from home between different schools, *Wilks' Lambda* = .932, $F(32, 6688) = 4.02$, $p < .001$. Differences between schools were various and therefore not interpretable (Table 7.4).

Table 7.4. MANOVA test results on encountered problems with studying from home, broken down to school (n = 1825)

Encountered problems	School										
	TiSEM (a)		TLS (b)		TSB (c)		TSHD (d)		TST (e)		
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*-test
Concentration problems and distractions caused by the surroundings of your study place (way in which study place is set up, distractions caused by family members/roommates)	2.96 c d	1.16	3.05	1.22	3.19 a	1.18	3.22 a	1.28	3.00	1.29	3.80**
Concentration problems and distractions caused by fretting and worrying	2.54 c d	1.25	2.77	1.31	2.79 a	1.24	2.93 a	1.29	2.44	1.26	6.47***
Technical problems (bad internet connection, no working camera, software problems)	2.23	1.08	2.20	1.11	2.26	1.09	2.27	1.18	2.20	1.12	.22
Lack of a suitable workplace	2.30 c	1.33	2.37	1.33	2.53 a	1.35	2.54	1.38	2.20	1.29	3.12*
Reduced motivation	3.08	1.26	3.08	1.30	3.24	1.14	3.30 e	1.27	2.56 d	1.39	4.26**
Missing contact with fellow students	3.17 d	1.22	3.12 d	1.31	3.30	1.22	3.47 a b	1.24	3.48	1.23	4.74**
Missing contact with lecturers	2.56 b c d	1.24	2.92 a d	1.23	2.78 a d	1.22	3.17 a b c	1.20	3.32	1.28	15.65***
Too little time due to increased (informal) care responsibilities	1.64 c d	1.11	1.75	1.18	1.94 a	1.27	1.97 a	1.27	2.28	1.37	7.22***

**p < .05, **p < .01, *** p < .001. Note. M = Mean, SD = Standard Deviation. All encountered problems were scored on a scale from 1 (never) to 5 (always). Df (2, 1858)*

7.2. Undertaken actions to solve problems

Students who indicated that they encountered problems at least occasionally (in at least one area) were asked what action they had taken to solve the problem(s). Only 30.2% of the students indicated that they have not sought help. 46.5% of the students reported to have taken action by seeking help from fellow students and 26.0% by looking for a new workplace (Figure 7.2).

Figure 7.2. Undertaken actions to solve problems with "yes"-answers in percentages (n = 1863)

Additional analyses showed significant associations between what actions students had taken to solve potential problems and whether or not being an international student. National students seem **more** likely than international students to have not looked for help at all. International students seem **more** likely than national students to have looked for help from fellow students, lecturers, education coordinators, student deans or psychologists, and other student counselors at the university. International students also seem **more** likely than national students to have investigated possibilities to study on campus anyway (Table 7.4).

Table 7.4. Chi-square test results of actions students undertook to solve problems in percentages of 'yes'-answers, broken down to national versus international students (n = 1863)

	Group		
Actions to solve problems	National (a)	International (b)	χ-test
I didn't look for help	34.0% [b]	22.1% [a]	27.66***
Looked for help from fellow students	43.0% [b]	54.0% [a]	19.89***
Looked for help from lecturer	12.3% [b]	21.5% [a]	26.25***
Looked for help from education coordinator	8.9% [b]	21.9% [a]	60.85***
Looked for help from student deans or psychologists	3.9% [b]	7.3% [a]	9.75**
Looked for help from other student counselor(s)* at the university	4.1% [b]	8.3% [a]	13.37***
Looked for a new place to work (e.g., with family)	26.8%	24.4%	1.21
Investigated possibilities to study on campus anyway	9.5% [b]	14.2% [a]	9.32**
Organized or attended alternative (online) meetings with students/lecturers (such as a thematic meeting or pub quiz)	7.1%	8.6%	1.32
Otherwise	6.9%	8.7%	1.96

***p < .01, ***p < .001. Note. Df (1).*

Additional analyses also showed one significant association between places students would look for support and different study phases. We found that Master's students seem **more** likely to have looked for help from their lecturer(s) than Bachelor's 2/3 students (Figure 7.5).

Table 7.5. Chi-square test results of actions students undertook to solve problems in percentages of 'yes'-answers, broken down to study phase (n = 1796)

	Study phase			
Actions to solve problems	Bachelor's 1 (a)	Bachelor's 2/3 (b)	Master's (c)	χ-test
I didn't look for help	24.6%	29.1%	31.5%	2.82
Looked for help from fellow students	50.0%	49.5%	44.0%	5.44
Looked for help from lecturer	11.4%	13.1% [c]	18.2% [b]	9.83**
Looked for help from education coordinator	14.0%	12.8%	14.0%	.57
Looked for help from student deans or psychologists	5.3%	4.9%	5.1%	.03
Looked for help from other student counselor(s)* at the university	5.3%	5.5%	5.3%	.04
Looked for a new place to work (e.g., with family)	21.1%	25.2%	27.7%	3.02
Investigated possibilities to study on campus anyway	6.1%	10.0%	12.5%	5.73
Organized or attended alternative (online) meetings with students/lecturers (such as a thematic meeting or pub quiz)	10.5%	8.8%	6.2%	5.52
Otherwise	7.9%	8.3%	6.6%	1.75

**p < .05, **p < .01. Note. Df (2).*

Finally, some significant associations were found between different schools, but those were various and therefore not interpretable.

Keypoints experiences with studying from home (7.1 to 7.2)

- A large group of students indicated to run into some problems often or always, including missing contact with fellow students (49.3%), reduced motivation (47.0%), and concentration problems and distraction due to the environment of the study place (43.0%).

- International students experience problems more often on all mentioned problems, except from missing contact with fellow students. Bachelor's 1 students experienced problems related to reduced motivation more often than Master's students. Moreover, Bachelor's 1 and Master's students experienced problems related to missing contact with lecturers more often than Bachelor's 2/3 students.

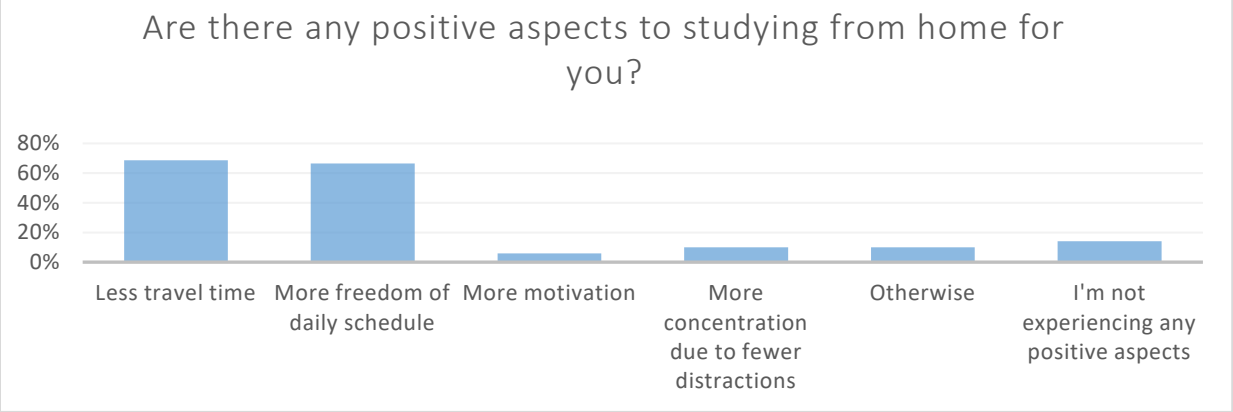
- Of students who indicated that they encountered problems, one in three students indicated to have not sought help. 46.5% of the students reported to have taken action by seeking help from fellow students and 26.0% by looking for a new workplace.

- National students seem **more** likely than international students to have not looked for help at all. International students seem **more** likely than national students to have looked for help from fellow students, lecturers, education coordinators, student deans or psychologists, and other student counselors at the university, or to have investigated possibilities to study on campus anyway. Master's students seem **more** likely to have looked for help from their lecturer(s) than Bachelor's 2/3 students.

7.3. Positive aspects of studying from home

We studied whether students experienced any positive aspects to studying from home. Only 14.1% of the students did not experience any positive aspects. Many students indicated less travel time (68.6%) and more freedom of daily schedule (66.6%) as positive aspects. Another 10.0% reported to experience other positive aspects. Students for example mentioned being watch online lectures in their own pace, spending more time with their friends and family, being able to combine other activities (e.g. work, hobbies, or sports) more easily, or having less travel expenses (Figure 7.3).

Figure 7.3. Positive aspects of studying from home, "yes"-answers in percentages (n = 1877)



Additional analyses showed significant associations between perceived positive aspects to studying from home and whether or not being an international student. National students seem **more** likely than international students to experience less travel time as a positive aspect. International students seem **more** likely than national students to not experience any positive aspects at all (Table 7.7).

Table 7.7. Chi-square test results of perceived positive aspects to studying from home in percentages of 'yes'-answers, broken down to national versus international students (n = 1877)

	Group		
Aspects	National (a)	International (b)	χ-test
Less travel time	72.7% [b]	60.0% [a]	30.77***
More freedom of daily schedule	66.8%	66.4%	.03
More motivation	6.2%	4.9%	1.31
More concentration due to fewer distractions	10.3%	9.3%	.39
Otherwise	9.2%	11.5%	2.31
I'm not experiencing any positive aspects	12.3% [b]	17.7% [a]	9.91**

***p < .01, ***p < .001. Note. Df (1).*

Additional analyses also showed significant associations between perceived positive aspects to studying from home and different study phases. We found that Master's students seem **more** likely than Bachelor's 1 and Bachelor's 2/3 students to experience having less travel time as a positive aspect. In addition, we found that Bachelor's 2/3 students seem **more** likely than Master's students to experience more motivation. Bachelor's 2/3 students also seem **more** likely than Bachelor's 1 students to experience more concentration due to fewer distractions. Moreover, Bachelor's 1 students seem **more** likely to not experience any positive aspects at all (Figure 7.8).

Table 7.8. Chi-square test results of perceived positive aspects to studying from home in percentages of 'yes'-answers, broken down to study phase (n = 1809)

	Study phase			
Aspects	Bachelor's 1 (a)	Bachelor's 2/3 (b)	Master's (c)	χ-test
Less travel time	58.6% [c]	66.0% [c]	72.7% [a b]	14.83**
More freedom of daily schedule	65.5%	67.7%	65.9%	.77
More motivation	5.2%	7.1% [c]	4.3% [b]	6.60*
More concentration due to fewer distractions	4.3% [b]	11.4% [a]	8.8%	6.21*
Otherwise	12.2%	10.7%	8.5%	2.44
I'm not experiencing any positive aspects	22.4% [b c]	12.6% [a]	14.5% [a]	8.46**

**p < .05, **p < .001. Note. Df (2).*

Finally, most additional analyses on associations between perceived positive aspects to studying from home and different schools were not possible because test assumptions were not met. Other associations with positive aspects were not significant, namely the aspect of less travel time and the aspect of more freedom of daily schedule, respectively $\chi(4) = 4.97$, $p > .05$ and $\chi(4) = 4.35$, $p > .05$.

7.4. Preferred form of education

Students indicated which form of education they preferred when the period of COVID-19 is over. The largest group of students reported to prefer blended learning, that is a combination of online education and on-campus education (50.7%). 37.8% of the students reported to prefer on-site education, 9.4% reported to prefer online education, and 2.1% reported to prefer other forms. When students indicated which other form they would prefer, they mainly mentioned to prefer to have the possibility of making the choice of online or on-site education themselves.

Additional analyses showed significant associations between preferred form of education and whether or not being an international student. National students seem **more** likely than international students to prefer a combination of online and on-campus education. International students seem **more** likely than national students to prefer education especially on campus (Table 7.9).

Table 7.9. Chi-square test results of preferred form of education in percentages of 'yes'-answers, broken down to national versus international students (n = 1876)

Education form								
Especially on campus (as before the COVID-19-outbreak)		Especially online (such as during the COVID-19-situation)		Combination of online and on-campus education (*blended* education)		Otherwise		
National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	National (a)	International (b)	χ-test
35.2% [b]	43.2% [a]	9.6%	9.2%	52.9% [b]	46.1% [a]	2.4%	1.5%	12.25**

***p < .01.. Note. Df (3).*

Additional analyses on associations between preferred form of education and different study phases and different schools were not possible because test assumptions were not met.

Keypoints experiences with studying from home (7.3 to 7.4)

- 14.1% of the students did not experience any positive aspects to studying from home. Many students indicated less travel time (68.6%) and more freedom of daily schedule (66.6%) as positive aspects. International students seem **more** likely than national students to not experience any positive aspects at all.

- Half of the students reported to prefer blended learning, 37.8% of the students reported to prefer on-site education, 9.4% reported to prefer online education, and 2.1% reported to prefer other forms. Students that reported the latter, mentioned to prefer to have the possibility of making the choice of online or on-site education themselves. National students seem **more** likely than international students to prefer a combination of online and on-campus education. International students seem **more** likely than national students to prefer education especially on campus. When students indicated which other form they would prefer, they mainly mentioned to prefer to have both forms of education, where students have the choice themselves.

Conclusions and discussion

Main findings

Commissioned by the board of Tilburg University this research focused on the wellbeing of students of Tilburg University. The present study had two main objectives, namely (1) to monitor the wellbeing of Tilburg University students and (2) to identify which factors, that which are the result of the COVID-19 situation in general, but more specific related to changes in education performance (e.g. online exams and social distancing), influence the wellbeing of students, in order to be able to adjust policy where necessary. The data for this research were gathered online by CenterData in the summer period between 13 August and 8 September 2020. This was a period where COVID-19-measures in the Netherlands were temporary relaxed. Sample size was *N* = 2,229, with a response rate of 13.4% (11.2% for total completion of the questionnaire).

Two thirds of the respondents (65.2%) were females, 32.8% were international students. Bachelor's 1 students were the smallest part of the respondents (6.9%) and the proportions of Bachelor's 2/3 students (47.3%) and Master's students (45.9%) were almost equally divided. One third of the participants were from TiSEM (33.4%), followed by 28.4% from TSB, 18,8% from TSHD, 17.9% from TLS, and 1,3% from TST. At the time of responding (and thus after the COVID-19-outbreak), 51.1% of the participants lived with their parents, 48.9% lived independently.

The impact of COVID-19 on the wellbeing of students in general

Living situation

The number of students that lived independently decreased from 71.4% to 49.8%. During the COVID-19-period, almost a quarter of the students (24.2%) moved back to live with their parents, whereas almost half of the students (46.7%) did not move and continued living independently.

The number of students that did not work in addition to their studies increased from 37.5% to 44.9%. When zooming in, we found that 26.0% worked before but started working fewer hours and 14.8% worked before the outbreak but did not work anymore at the time of participating. 30.1% did not have work both before and after the outbreak.

Physical and mental wellbeing

The physical wellbeing of students was negatively affected by the COVID-19-outbreak, although remaining between 'good enough' and 'good'. The majority of the students (74.0%) reported to have a (very) good physical wellbeing at time of participation. Students that have mental disabilities seemed to be more affected by their condition than students that have other disabilities or diseases.

The COVID-19-situation also seemed to have some impact on the mental wellbeing of students as well. First, life satisfaction was negatively affected by the COVID-19-outbreak, by decreasing from a grade of 7.38 to 6.58. Second, students experienced some stress because of the COVID-19-outbreak. They experienced most stress regarding their studies, their wellbeing, worries about their loved ones, society, social distancing, and their financial future. Third, almost half of the students was psychologically unhealthy, ranging from being slightly unhealthy to being seriously unhealthy. During the COVID-19-outbreak, students experienced a little worsening of mental health. Fourth, sleeping problems of students significantly increased during the COVID-19-period, by moving from having little trouble sleeping to having not little but also not a lot trouble sleeping. Fifth, one in six students reported to have suicidal thoughts to some degree, ranging from having these occasionally to (almost) always. The

average frequency of suicidal thoughts did not change during the COVID-19-period. Finally, at time of participation, the majority of students (56.9%) had normal resilience, 37.5% had low resilience, and 5.6% had high resilience.

If looking to more study-related wellbeing, students experienced performance pressure regularly and reported a little increase in performance pressure during the COVID-19-outbreak. Study-related exhaustion was experienced monthly or several times a month and students reported a little increase in study-related exhaustion during the COVID-19-outbreak.

Finally, the majority of students felt lonely in some way (43.8% felt somewhat lonely and 20.4% felt seriously lonely). During the COVID-19-period, students experienced a little increase of feelings of loneliness, where one in four students reported their loneliness became (much) more. As for feelings of connectedness, students felt a little less connected to the university compared to the period before the COVID-19-outbreak. Students experienced no change in connectedness with fellow students.

Substance use/abuse

Among the participants, 87.3% uses alcohol and 73.2% drinks on a non-acceptable if we adhire to the Dutch Health Council guidelines (more than one glass of alcohol per day). Furthermore, one in five students drink on a non-moderate level and almost one in seven students drink alcohol above the cut-off value for problematic alcohol use in students. Compared to the period before COVID-19-outbreak, students reported to drink a little less (42.4% drunk less, 24.4% drunk more than before).

For most of the other drug substances than alcohol, the majority of students (80.9%-98.5%) reported to have never used these, with the exception of cannabis use that 50.6% reported to have ever used. In general, the use of substances have remained the same compared to the period before the COVID-19-outbreak, except from users of sleep medication/sedatives without doctor's prescription (n = 70) and the psychedelic substance 2C-B (n = 44), where approximately half of the users reported to either have started using this or have used this more/more often since the outbreak.

Support

Students feel most strongly supported by their family, friends, and partner. On average, the source that students experienced more support from during the COVID-19-period were family, partner, and friends. The sources that students experienced fewer support from during the COVID-19-period were fellow students, lecturers, and university's student counselors.

When looking at support that students (have) needed/wished from the university, students mainly needed support in the areas of motivation (48.5%), contact with fellow students (45.3%), contact with teachers (46.0%), and daily structure (44.6%). For most areas that students needed support for, the majority of students reported that they had not found the needed support. Support in more psychological levels (i.e. mental wellbeing, daily structure, motivation, concentration problems, drug use) and financial support was most often not found.

The impact of COVID-19 on wellbeing for nationals against to internationals

Living situation

The number of national students that lived with their parents increased from 40.5% to 54.3%. However, this increase was much more profound for international students, as we found that the number of

internationals that lived with their parents increased from 3.7% to 41.6%. Still there are, relatively more international students who live independently.

National students seem more likely than international students to work in addition to their studies, both before and after the COVID-19-outbreak. The working hours in addition to studies of international students seem to not have changed during the COVID-19-period. It however does seem like fewer national students had a job after the COVID-19-outbreak, as the percentage of non-workers in that group increased from 27.4% to 38.8%.

Physical and mental wellbeing

Additional analyses showed no significant effect of whether or not being an international student on physical wellbeing. That means, the majority of the international students, like the national students reported to have a (very) good physical wellbeing.

On almost all mental wellbeing elements, international students scored more negative than national students. First, international students experienced performance pressure due to their own expectations more often than national students did. In addition, international students experienced a more 'negative' change in performance pressure than national students. Second, international students experienced significantly more stress on all sources of stress, except on stress about social distancing. Third, international students seem more likely to be psychologically unhealthy than national students. Moreover, international students experienced a stronger 'negative' change in mental health than national students during the COVID-19-outbreak. Fourth, international students had suicidal thoughts more often than national students. During the COVID-19-outbreak the average frequency of suicidal thoughts however remained the same. Fifth, as for study-related exhaustion, international experienced this more often than national students. International students also experienced a stronger 'negative' change than national students during COVID-19-period. Finally, international students seem more likely to be lonely than national students at the time of participation, although there was no difference between international and national students in experienced change in loneliness.

Substance use/abuse

International students seem more likely than national students to be abstainers from alcohol. Furthermore, national students seem more likely than international students to drink on a non-acceptable, non-moderate, and problematic level. On average, students reported to drink a little less during the COVID-19 outbreak. This reduction was more profound for national students than for international students.

There were some differences between international and national students in the use of cannabis, xtc, and mushrooms/truffles. For example, international students seemed more likely to have used cannabis and mushrooms and/or truffles in the last year than national students. National students seemed more likely to have used XTC in the last 30 days. International students seem more likely to have stopped their cannabis use since the outbreak than national students did.

Support

International students felt more supported by their family and lecturers than national students, whereas national students felt more supported by their partner and roommates. In addition, international students experienced more 'positive' change in support from family and friends than national students.

National students experienced more 'negative' change in support from fellow students, lecturers, and university's student counselors than international students.

National students seem more likely to need support in contact with fellow students and in daily structure, whereas international students seem to be more likely to need financial support and support in mental wellbeing. International students were more likely than national students to have found the support students they needed. This was the case for support in contact with fellow students, contact with lecturers, motivation, concentration problems, technical support and financial support.

National students seem more likely than international students to search for support on the Tilburg University website and by asking study associations. In contrast, international students seem more likely than national students to search for support on social media of Tilburg University, by asking their lecturer(s), or in other places.

The impact of COVID-19 on wellbeing regarding phase of study

Physical and mental wellbeing

No significant effect of study phases on physical wellbeing was found, but effects were found on some mental wellbeing elements. First, Master's students experienced a stronger 'negative' change in performance pressure than Bachelor's 2/3 students during the COVID-19-outbreak. Second, Master's students experienced more stress regarding their loved ones and social distancing than Bachelor's 2/3 students. Master's students also experienced more stress regarding their current financial situation and their financial future than both the Bachelor's 1 and Bachelor's 2/3 students. Third, Bachelor's 2/3 students had suicidal thoughts more often than Master's students. Finally, Bachelor's 1 students experienced significantly more 'negative' change than Master's students in feelings of connectedness with the university and fellow students. In summary Master's students and to a lesser extent Bachelor's 1 students, seem to be more affected by the COVID-19 outbreak than Bachelor's 2/3 students.

Substance use/abuse

On average, students reported to drink a little less during the COVID-10 outbreak. This reduction was more profound for Bachelor's 1 and Bachelor's 2/3 students than for Master's students. Bachelor's 2/3 students seemed more likely to have used cannabis in the last 30 days than Master's students. No other differences were found in drug use between study phases.

Support

Master's students felt more supported and experienced more 'positive' change in this than Bachelor's 2/3 students. Bachelor's 1 students experienced more 'negative' change in support from fellow students than Master's students.

Master's students seem to be more likely than Bachelor's 2/3 students to need support in contact with fellow students and lecturers. In addition, Bachelor's 1 and Bachelor's 2/3 students seem to be more likely to need support in daily structure than Master's students.

Master's students seem more likely than Bachelor's 2/3 students to search for support by asking their lecturer(s) and by asking their fellow students. In addition, Bachelor's 1 and Bachelor's 2/3 students seem more likely than Master's students to search for support by asking the student counselor(s) of the university.

The impact of COVID-19 on wellbeing between schools

When we look after the impact of COVID-19 on wellbeing between schools, we noticed that, although some significant associations were found between different schools in general, those were various and therefore not interpretable.

The consequences of distance education and studying from home

Online lectures

Most students appear to be positive about the online lectures offered in particular. For all other components, student responses vary widely, with a significant portion being negative and a significant portion being positive. On average, students reported a score between 'neutral' and 'a little positive' for online lectures, individual coaching, and online assessment. Students reported a score between 'a little negative' and 'neutral' for online workgroups/practicals. National students experienced the online lectures more positive than international students. Furthermore, Master's students experienced individual coaching as more positive than Bachelor's 2/3 students.

Looking into the future, half of the students reported to prefer blended learning, 37.8% of the students reported to prefer on-site education, 9.4% reported to prefer online education, and 2.1% reported to prefer other forms. Students that reported the latter, mentioned to prefer to have the possibility of making the choice of online or on-site education themselves. National students seem more likely than international students to prefer a combination of online and on-campus education. International students seem more likely than national students to prefer education especially on campus.

Study success

The largest group of students (29.9%) reported that their study success had not been influenced by the other form of assessment. On average, the perceived effect of other assessment forms on study success was between 'a little negative' and 'neutral'. TSHD, TSB, and TiSEM students thought significantly more negative about the influence of the other assessment form on their study success than TLS students.

The majority of students (69.3%) did not think that the COVID-19 outbreak caused a study delay. National students seem more likely than international students to think the COVID-19-outbreak caused no study delay at all. International students seem more likely than national students to think the COVID-19-outbreak caused a study delay.

Study conditions

A large group of students indicated to run into some problems often or always, including missing contact with fellow students (49.3%), reduced motivation (47.0%), and concentration problems and distraction due to the environment of the study place. International students experience problems more often on all mentioned problems, except from missing contact with fellow students. In addition, Bachelor's 1 students experienced problems related to reduced motivation more often than Master's students. Moreover, Bachelor's 1 and Master's students experienced problems related to missing contact with lecturers more often than Bachelor's 2/3 students.

Of students who indicated that they encountered problems, one in three students indicated to have not sought help. 46.5% of the students reported to have taken action by seeking help from fellow students and 26.0% by looking for a new workplace. National students seem more likely than international students to have not looked for help at all. International students seem more likely than national students to have looked for help from fellow students, lecturers, education coordinators, student deans

or psychologists, and other student counselors at the university, or to have investigated possibilities to study on campus anyway. Master's students seem more likely to have looked for help from their lecturer(s) than Bachelor's 2/3 students.

Finally, students also experienced some positive aspects to studying from home. Many students indicated less travel time (68.6%) and more freedom of daily schedule (66.6%) as positive aspects. This was perceived more by national students than international students. Master's students seem more likely than Bachelor's 1 and Bachelor's 2/3 students to experience having less travel time as a positive aspect.

In addition, we found that Bachelor's 2/3 students seem more likely than Master's students to experience more motivation. Bachelor's 2/3 students also seem more likely than Bachelor's 1 students to experience more concentration due to fewer distractions. A minority of the students (14%) did not experience any positive aspects to studying from home. International students seem more likely than national students to not experience any positive aspects at all. Bachelor's 1 students seem more likely to not experience any positive aspects at all than Bachelor's 2/3 and Master's students.

Although some significant associations were found between different schools in consequences of distance education, like the reported findings regarding study success, in general the differences in distance education and studying from home were various and therefore not interpretable.

Methodological considerations

There are some methodological considerations to the present study. First, some constructs such as physical wellbeing and life satisfaction were measured using the same two scales, but with different time indications, namely before and after the COVID-19-outbreak. As respondents reported their answers at the same time and they had to think back retrospectively to their experiences before the COVID-19-outbreak, there is a possibility that these 'time'-differences are more significant. This may be the result of a so-called recall bias, where people experience the past as being much rosier than at the time of participating, while the actual differences may be smaller.

Second, the responding students may be a specific sample of the total student population of Tilburg University (sampling bias). They could be more interested in the COVID-19 theme because of experiencing a higher impact of the COVID-19 situation on their wellbeing.

Third, various questions regarding wellbeing asked students about experienced change in another way than described above. These questions asked to rate in what way their experiences had changed compared to the period before the COVID-19-outbreak. Although this was the most appropriate way to ask students about changes, this also may give a distorted picture. For example, suppose that student A did not feel lonely at all before the COVID-19-outbreak, but did report a small increase in loneliness, then student A could still be at an "acceptable" level of loneliness. However, it is possible that student B already felt very lonely before the COVID-19-outbreak, but also reported a small increase in perceived loneliness. Student B would then be at a very severe level of loneliness, although this cannot be revealed in the results. The 'change compared to before the COVID-19-outbreak'-questions are therefore not sensitive to these differences in starting points of respondents.

Fourth, we used many validated measuring instruments. However, for a few topics those instruments did not exist. For these topics we developed our own (not validated) items or we used questions of other questionnaires that have not been validated yet.

Fifth, monitoring of wellbeing took place during the summer, after the first COVID-19 outbreak, in a period where COVID-19 measures were more relaxed. Moreover, students were free from educational obligations, as it was their summer holiday. The wellbeing of students may be 'masked' by these potentially rather positive experiences. Students may even have experienced a reduction in negative feelings. Therefore, results of a follow-up research, after the second COVID-19-outbreak, may paint another picture.

Sixth, as often seen in student research, a small percentage of Bachelor's 1 students (6.9%) filled out the questionnaire. Therefore, the findings in the present study related to Bachelor's 1 students may not been fully representative. Furthermore, due to this small sample of Bachelor's 1 students, we were unable to demonstrate significant differences in some analyses.

Seventh, although our aim was to keep the questionnaire as concise as possible, the developed questionnaire was quite long. This might have deterred students from participating in the study. We however think this length was necessary to get a thorough picture of the current state of wellbeing, needs, and experiences of students. We still did set a limit in questionnaire length, which therefore did not allow us to also map other desired and relevant wellbeing constructs, such as smoking behavior and physical activity.

Future research

The present study offers insight in the wellbeing and experiences of students of Tilburg University in times of COVID-19. However, this is only a snapshot and the second COVID-19-outbreak may have altered these findings already. Therefore, it is important to continue to monitor student wellbeing.

From 2021 on, a national student wellbeing monitor (DrieMS) will be conducted yearly in various Dutch universities and universities of applied sciences. The first measurement will take place in the spring of 2021. Tilburg University will be participating in this national monitor, which is relevant and insightful for various reasons. First, the DrieMS student wellbeing monitor offers the opportunity to follow-up on the findings of the present study, as a substantial amount of the DrieMS research questions and measures correspond to the research questions and measures in the present study. Second, through participation in DrieMS, we can get more insight in the impact of the second COVID-19 outbreak on Tilburg University's students. Third, it will be possible to compare Tilburg University's findings to national levels. Lastly, as DrieMS will be conducted every following year, it is possible to get insight in the long-term impact of COVID-19 on student wellbeing.

Moreover, in addition to the DrieMS, Tilburg University may choose to repeat or extend the present student wellbeing monitor. In that case, we recommend to incorporate more lifestyle themes, such as smoking tobacco and physical activity, as these are relevant for building resistance against viruses like COVID-19 and their consequences.

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Appendix

Appendix A – Questionnaire

Wat is je voorkeurstaal voor de vragenlijst? / What is your preferred language for the questionnaire?

- ○ Nederlands / Dutch
- ○ Engels / English

Information letter

Student welfare monitor and experiences education in times of COVID-19

Thank you for taking the time to participate in this survey. This survey is carried out by Academic Services in collaboration with Tranzo (Tilburg University Scientific Centre for Care and Wellbeing) on behalf of the Tilburg University Executive Board. Before you start the questionnaire, it is important that you are aware of the purpose of the survey and how the collected data is handled. Therefore, please read the information below.

What is the survey about?
Especially in this time of COVID-19, we are curious to see how our students are doing. Based on this survey, Tilburg University wants to get a picture of how students feel and how they have experienced or are experiencing education in times of COVID-19. The results will be delivered to the Executive Board. Participation in the questionnaire, therefore, gives you the opportunity to have influence on the educational developments in the context of the corona measures.

What does participation mean?
You fill out the questionnaire. It takes about 15 to 20 minutes to complete. You can participate in this survey if you were enrolled as a student at Tilburg University in the previous semester (January 2020–July 2020). The questions are about your:

- home and housing situation;
- (mental) well-being;
- substance use;
- experiences with support from the university;
- experiences with digital education;
- experiences with studying from home;

Important to know
Participation is entirely voluntary. If you do not wish to participate, this has no consequences. Should you decide to participate and change your mind later, you may stop at any time. You do not have to give a reason for this and this has no negative consequences. There are no physical, legal, or economic risks associated with your participation. Participants have the right, in principle, to inspect, rectify, delete, limit, or object to the processing of personal data. More information can be found on the Tilburg University website: https://www.tilburguniversity.edu/privacy. Among other things, the questionnaire asks about special categories of personal data, namely your mental and physical well-being. At the end of the questionnaire, there is an opportunity to register for follow-up research in the form of an interview.

Your privacy is and remains maximally protected. Results from this survey will be presented in various ways in the future, for example in a report to the Executive Board, (academic) articles, and in a summary fact sheet that will be made available to Tilburg University students. The results will never be traceable to individual participants in the survey. No confidential information or personal data of or about you will be disclosed in any way.

The answers to the questionnaire are stored in a secure environment at Tilburg University and erased after 15 years. For scientific publications, information about this research can be shared for scientific reuse for a period of 10 years. This survey has been assessed and approved by the Ethics Review Board (ERB) of Tilburg University's School of Social and Behavioral Sciences under number RP258.

Questions, comments, or complaints
Should you have any questions about the survey after reading this information letter or in the future, you can ask them at any time via studentenmonitor@tilburguniversity.edu. For any comments or complaints about this survey, you can also contact the Ethics Review Board of the Tilburg School of Social and Behavioral Sciences at ERB@tilburguniversity.edu.

Letter of agreement

I, the undersigned, declare:

- I have read and understood the information letter. I was able to ask questions and my questions were sufficiently answered.
- I know that participation in this survey is voluntary and that I have the right not to answer questions. I also know that I can decide at any time not to participate or to stop participating in the survey. I do not have to give a reason for this and this does not have any negative consequences for me.
- I know that, in principle, I have the right of access, to rectification, to erasure, to restriction, or to object to the processing of personal data. More information can be found on the Tilburg University website: https://www.tilburguniversity.edu/privacy.
- I consent to the collection, storage, and use of my data, including special categories of personal data as further explained in the written information, for the purpose of this survey. I consent to the pseudonymized processing of my data. I agree that the results of this survey will be presented in writing and orally and know that my data will be treated confidentially.
- I give permission for all information from this survey to be stored for 15 years in a secure environment at Tilburg University. I grant permission for research information to be made available for reuse for future scientific research for a period of 10 years.
- I give permission for researchers to approach me again for follow-up research in the form of an interview if I have registered via studentenmonitor@tilburguniversity.edu.

☐ I understand the text mentioned above and voluntarily agree to participate in this survey.

I am*:

○ A man
○ A woman
○ Other, namely: _____
○ I'd rather not say

---

* These response categories are linked to the way in which the government collects information on gender.

What's your age?

_____ years old

Which country did you live in before you started your studies in Tilburg?

○ The Netherlands
○ Belgium
○ Canada
○ China
○ Denmark
○ Germany
○ France
○ Italy
○ United States
○ Otherwise, namely _____
○ I'd rather not say

In which country do family members with whom you have the most contact live?

- ○ The Netherlands
- ○ Belgium
- ○ Canada
- ○ China
- ○ Denmark
- ○ Germany
- ○ France
- ○ Italy
- ○ United States
- ○ Otherwise, namely
- ○ I don't know
- ○ I'd rather not say

Do you have a partner?

- ○ No, I don't have a partner
- ○ Yes, I have a partner I don't live with
- ○ Yes, I have a partner I live with

Are you an international student*?

- ○ Yes
- ○ No

---

*Have you come to the Netherlands to study or do an internship.

At what level of your studies are you?

- ○ Bachelor 1
- ○ Bachelor 2
- ○ Bachelor 3
- ○ Pre-master
- ○ Master – one year
- ○ Master – two year
- ○ Extended master
- ○ Other, namely:

Which of the following Schools offers your study program(s)?
Multiple answers possible

- ☐ Tilburg School of Economics & Management
- ☐ Tilburg Law School
- ☐ Tilburg School of Social and Behavioral Sciences
- ☐ Tilburg School of Humanities and Digital Sciences
- ☐ Tilburg School of Catholic Theology
- ☐ Other, namely: _____

The following questions concern your home and financial situation before and after the COVID-19 outbreak. When we ask how something was 'before the COVID-19 outbreak' we refer to the period **before mid-March 2020**. When we ask how something was 'after the COVID-19 outbreak' we want to know how something was, most of the time, in the period **from mid-March 2020** until filling out the questionnaire.

How was your home situation before the COVID-19 outbreak, and how was it after the COVID-19 outbreak?

I live/I lived...

Please note: In both columns, tick one of the six boxes. If more than one applies, choose the answer that is most applicable to your situation (where you lived / live most of the time).

	Before the COVID-19 outbreak	After the COVID-19 outbreak
at my parents' house	☐	☐
in a student flat or student residence of a student housing organization	☐	☐
in a private student residence	☐	☐
on my own in a private house or apartment (for sale or rent)	☐	☐
together with my partner in a private house or apartment (for sale or rent)	☐	☐
Other, namely: _____	☐	☐

How many hours do you work on average per week in addition to your studies?

	I don't/didn't work	1-4 hours per week	5-8 hours per week	9-12 hours per week	13-16 hours per week	17-20 hours per week	More than 20 hours a week
Before COVID-19 outbreak	○	○	○	○	○	○	○
After the COVID-19 outbreak	○	○	○	○	○	○	○

The following questions are about your perceived health and possible disability.

In general, how is/was your physical health?

	Very bad	Bad	Good enough	Good	Very good
At the moment	○	○	○	○	○
Before COVID-19 outbreak	○	○	○	○	○

The next question is about any disabilities, conditions, or illnesses you may be experiencing.

Do you have one or more of the following disabilities, disorders, or diseases?
(multiple answers possible)

- ☐ ADHD, ADD or concentration problems
- ☐ Autism (Autism Spectrum Disorder (ASD), Classical Autism, Asperger and PDD-NOS (including subgroup McDD))
- ☐ Mobility restriction
- ☐ Chronic affliction/disease (migraine, pulmonary disease, skin disease, diabetes, chronic fatigue syndrome, rheumatism, osteoarthritis, MS, muscle disease, cancer, epilepsy, cardiovascular disease, intestinal disorder, etc.).
- ☐ Dyslexia or dyscalculia
- ☐ Psychological disorder (depression, psychosis, manic-depressive disorder, schizophrenia, bipolar disorder, anxiety disorder, borderline, eating disorder, etc.).
- ☐ Sensory impairment (problems with seeing, hearing, speaking)
- ☐ I don't want to say this
- ☐ None of these conditions or diseases
- ☐ Other affliction/disease, namely: _____

Are you currently affected more or less by your disability/disabilities and/or disease(s)/disorder(s) in daily life than in the period before the COVID-19 outbreak?

	Much more affected	More affected	A little more affected	The same	A little less affected	Less affected	Much less affected
[FUNBEP1=1]ADHD, ADD or concentration problems	○	○	○	○	○	○	○
[FUNBEP1=2]Autism	○	○	○	○	○	○	○
[FUNBEP1=3]Mobility restriction	○	○	○	○	○	○	○
[FUNBEP1=4]Chronic affliction/disease	○	○	○	○	○	○	○
[FUNBEP1=5]Dyslexia or dyscalculia	○	○	○	○	○	○	○
[FUNBEP1=6]Mental illness	○	○	○	○	○	○	○
[FUNBEP1=7]Sensory impairment	○	○	○	○	○	○	○
[FUNBEP1=8]I don't want to say this	○	○	○	○	○	○	○
[FUNBEP1=9]None of these conditions or diseases	○	○	○	○	○	○	○
[FUNBEP1=10]Other affliction/disease, namely:^FUNBEP1and;	○	○	○	○	○	○	○

The following questions are about your mental well-being. We use several existing questionnaires, of which the questions are fixed. Therefore, the following questions may resemble each other.

Which number fits best with how you feel/felt about your life?
0 means the worst possible life and 10 the best possible life.

	Worst possible life 0	1	2	3	4	5	6	7	8	9	Best possible life 10
At the moment	○	○	○	○	○	○	○	○	○	○	○
Before COVID-19 outbreak	○	○	○	○	○	○	○	○	○	○	○

How often do you feel you're under pressure to...

	Not at all	Sometimes	Regularly	Often
Meet your own expectations?	○	○	○	○
Meet the expectations of others?	○	○	○	○

The previous question was about experiencing performance pressure. In general, has this changed compared to the period before the COVID-19 outbreak?

Became much more	Became more	Became a little more	Remained the same	Became a little less	Became less	Became much less
○	○	○	○	○	○	○

Please respond to each item by marking one box per row.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I tend to bounce back quickly after hard times	○	○	○	○	○
I have a hard time making it through stressful events	○	○	○	○	○
It does not take me long to recover from a stressful event	○	○	○	○	○
It is hard for me to snap back when something bad happens	○	○	○	○	○
I usually come through difficult times with little trouble	○	○	○	○	○
I tend to take a long time to get over set-backs in my life	○	○	○	○	○

To what extent do/did you have trouble sleeping? Think of difficulty falling asleep, difficulty sleeping through the night, or waking up too early.

	Barely to none	Little	Not little/not a lot	A lot	Very much
At the moment	○	○	○	○	○
Before COVID-19 outbreak	○	○	○	○	○

To what extent have you experienced stress due to the COVID-19 outbreak regarding:

	Barely to none	Little	Not little/not a lot	A lot	Very much
your studies (online education, possible study delay due to COVID-19 outbreak)	○	○	○	○	○
your well-being	○	○	○	○	○
your loved ones	○	○	○	○	○
society	○	○	○	○	○
social distancing (digital communication, 1.5 meters distance, no physical contact)	○	○	○	○	○
combining care for others and work/studies	○	○	○	○	○
coverage of COVID-19 in the media	○	○	○	○	○
your current home situation (I don't live where, with whom, or how I want)	○	○	○	○	○
your current financial situation	○	○	○	○	○
your financial future	○	○	○	○	○

To what extent do these statements apply to you?

	Never	Several times a year	Monthly	Several times a month	Weekly	Several times a week or every day
I feel emotionally drained by my studies	○	○	○	○	○	○
I feel used up at the end of a day at school	○	○	○	○	○	○
I feel tired when I get up in the morning and I have to face another day at school	○	○	○	○	○	○
Studying or attending a class is really a strain for me	○	○	○	○	○	○
I feel burned out from my studies	○	○	○	○	○	○

The previous questions were about possible psychological complaints in relation to your studies. In general, have these changed compared to the period before the COVID-19 outbreak?

Became much more	Became more	Became a little more	Remained the same	Became a little less	Became less	Became much less
○	○	○	○	○	○	○

The following questions are also about your mental well-being and may be similar to the previous questions.

Please indicate for each question the answer that best reflects how you felt in the past 4 weeks? How much of the time ...

	All of the time	Most of the time	A good bit of time	Some of the time	A little of the time	None of the time
Have you been a very nervous person?	○	○	○	○	○	○
Have you felt so down in the dumps that nothing could cheer you up?	○	○	○	○	○	○
Have you felt calm and peaceful?	○	○	○	○	○	○
Have you felt downhearted and blue?	○	○	○	○	○	○
Have you been a happy person?	○	○	○	○	○	○

The previous questions were about mental well-being. Has this generally changed compared to the period before the COVID-19 outbreak?

Became much worse	Became worse	Became a little worse	Remained the same	Improved a little	Improved	Improved a lot
○	○	○	○	○	○	○

In the past 4 weeks, how often did you wish you were dead or went to sleep and never wake up again?

(Almost) always	Usually	Sometimes	Occasionally	Never
○	○	○	○	○

The previous question was about possible suicidal thoughts. Has this changed compared to the period before the COVID-19 outbreak?

Became much more	Became more	Became a little more	Remained the same	Became a little less	Became less	Became much less
○	○	○	○	○	○	○

If you want to give an explanation about (other) changes in mental well-being that you noticed, you can do so in the text box below:

The following questions concern the consumption of alcoholic beverages. This refers to drinks with more than 0.5% alcohol, such as beer, wine, spirits, mixed drinks, or cocktails.

Have you been drinking alcoholic beverages in the last 12 months?

- ○ Yes
- ○ No

Have you ever drunk alcohol?

- ○ Yes
- ○ No

On how many of the 4 weekdays, meaning Monday to Thursday, do you drink alcoholic beverages on average?

- ○ 4 days
- ○ 3 days
- ○ 2 days
- ○ 1 day
- ○ Less than 1 day
- ○ I never drink on weekdays

How many glasses do you drink on average on such a weekday?

- ○ 21 or more glasses
- ○ 16-20 glasses
- ○ 10-15 glasses
- ○ 7-9 glasses
- ○ 6 glasses
- ○ 5 glasses
- ○ 4 glasses
- ○ 3 glasses
- ○ 2 glasses
- ○ 1 glass

On how many of the 3 weekend days, i.e. Friday to Sunday, do you drink alcoholic beverages on average?

- ○ 3 days
- ○ 2 days
- ○ 1 day
- ○ Less than 1 day
- ○ I never drink on the weekend

How many glasses do you drink on average on such a weekend day?

- ○ 21 or more glasses
- ○ 16-20 glasses
- ○ 10-15 glasses
- ○ 7-9 glasses
- ○ 6 glasses
- ○ 5 glasses
- ○ 4 glasses
- ○ 3 glasses
- ○ 2 glasses
- ○ 1 glass

How often have you drunk 4 or more glasses of alcoholic beverage in one day during the past 6 months?

- ○ On a daily basis
- ○ 5-6 times a week
- ○ 3-4 times a week
- ○ 1-2 times a week
- ○ 1-3 times a month
- ○ 3-5 times per 6 months
- ○ 1-2 times per 6 months
- ○ Never

How many times during the past 6 months have you drunk 6 or more glasses of alcoholic beverages in one day?

- ○ On a daily basis
- ○ 5-6 times a week
- ○ 3-4 times a week
- ○ 1-2 times a week
- ○ 1-3 times a month
- ○ 3-5 times per 6 months
- ○ 1-2 times per 6 months
- ○ Never

Do you currently drink more or fewer alcoholic beverages in relation to the period before the COVID-19 outbreak?

Much less	Less	A little less	The same	A little more	More	Much more
○	○	○	○	○	○	○

Have you ever used the following drugs, and if so, when was the last time?

	No, never used	Yes, more than 12 months ago	Yes, in the last 12 months but not in the last 30 days.	Yes, in the last 30 days
Cannabis (hash, weed, marijuana)	○	○	○	○
XTC (ecstasy, MDMA)	○	○	○	○
LSD	○	○	○	○
Mushrooms and/or truffles	○	○	○	○
Cocaïne	○	○	○	○
2C-B	○	○	○	○
GHB or GBL	○	○	○	○
Ketamine	○	○	○	○
4-Fluoramphetamine, also called 4-FA, 4-FMP or Flux	○	○	○	○
Nitrous oxide	○	○	○	○
Methylphenidate or dexamphetamine without doctor's prescription (these are ADHD drugs such as Ritalin, Concerta)*	○	○	○	○
Modafinil without doctor's prescription	○	○	○	○
Sleep medication or sedatives without doctor's prescription (such as Temazepam, Oxazepam, Valium, and Seresta)*	○	○	○	○

Other substance, namely	No, never used	Yes, more than 12 months ago	Yes, in the last 12 months but not in the last 30 days.	Yes, in the last 30 days
	○	○	○	○
Other substance, namely	No, never used	Yes, more than 12 months ago	Yes, in the last 12 months but not in the last 30 days.	Yes, in the last 30 days
	○	○	○	○

*drugs available at the drugstore or health food store are not meant here.

You indicated that you used the substance(s) below. In general, has this changed compared to the period before the COVID-19 outbreak? Indicate per substance.

	I've been using this drug since the COVID-19 outbreak	I've been using this drug since the COVID-19 outbreak more/more often	My use of this drug has remained the same since the COVID-19 outbreak	I've been using this drug less/less often since the COVID-19 outbreak	I've stopped using this drug since the COVID-19 outbreak.
	○	○	○	○	○
[MID1calc2=1]XTC (ecstasy, MDMA)	○	○	○	○	○
[MID1calc3=1]LSD	○	○	○	○	○
[MID1calc4=1]Mushrooms and/or truffles	○	○	○	○	○
[MID1calc5=1]Cocaïne	○	○	○	○	○
[MID1calc6=1]2C-B	○	○	○	○	○
[MID1calc7=1]GHB or GBL	○	○	○	○	○
[MID1calc8=1]Ketamine	○	○	○	○	○
[MID1calc9=1]4-Fluoramphetamine, also called 4-FA, 4-FMP or Flux	○	○	○	○	○
[MID1calc10=1]Nitrous oxide	○	○	○	○	○
[MID1calc11=1]Methylphenidate or dexamphetamine without a doctor's prescription (these are ADHD drugs such as Ritalin, Concerta)	○	○	○	○	○
[MID1calc12=1] Modafinil without doctor's prescription	○	○	○	○	○
[MID1calc13=1]Sleep medication or sedatives without doctor's prescription (such as Temazepam, Oxazepam, Valium and Seresta)	○	○	○	○	○
[MID1calc14=1]Other substance, namely: : ^MID1_14.MID1open;	○	○	○	○	○
[MID1calc15=1]Other substance, namely: ^MID1_15.MID1open;	○	○	○	○	○

If you would like to give an explanation about noticeable changes in substance use, you can do so in the text box below:

The following questions are about support you may have experienced and feelings of connectedness.

Please respond to each item by marking one box per row.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N/A
I feel supported by my family	○	○	○	○	○	○
I feel supported by my friends	○	○	○	○	○	○
I feel supported by my partner	○	○	○	○	○	○
I feel supported by my roommates	○	○	○	○	○	○
I feel supported by my fellow students	○	○	○	○	○	○
I feel supported by my lecturers	○	○	○	○	○	○
I feel supported by the university's student counselors*	○	○	○	○	○	○
I feel connected to my fellow students	○	○	○	○	○	○
I feel connected to the university	○	○	○	○	○	○

* mentor, education coordinator, dean of students, student psychologist, student chaplain, study choice or career coach

These questions were about experienced support and connectedness. Have these theses changed since the period before the COVID-19 outbreak?

	Became much more	Became more	Became a little more	Remained the same	Became a little less	Became less	Became much less	N/A
I feel supported by my family	○	○	○	○	○	○	○	○
I feel supported by my friends	○	○	○	○	○	○	○	○
I feel supported by my partner	○	○	○	○	○	○	○	○
I feel supported by my roommates	○	○	○	○	○	○	○	○
I feel supported by my fellow students	○	○	○	○	○	○	○	○
I feel supported by my lecturers	○	○	○	○	○	○	○	○
I feel supported by the university's student counselors*	○	○	○	○	○	○	○	○
I feel connected to my fellow students	○	○	○	○	○	○	○	○
I feel connected to the university	○	○	○	○	○	○	○	○

* mentor, education coordinator, dean of students, student psychologist, student chaplain, study choice or career coach

Are there any other people that made you feel supported at this time or before the COVID-19 outbreak?

Please indicate for each of the following statements, the extent to which they apply to your situation, the way you feel.

	Yes	More or less	No
I experience a general sense of emptiness	○	○	○
There are plenty of people I can rely on when I have problems	○	○	○
There are many people I can trust completely	○	○	○
There are enough people I feel close to	○	○	○
I miss having people around me	○	○	○
I often feel rejected	○	○	○

The previous questions were about experiencing loneliness. Has this changed compared to the period before the COVID-19 outbreak?

Became much more	Became more	Became a little more	Remained the same	Became a little less	Became less	Became much less
○	○	○	○	○	○	○

If you want to give an explanation about noticeable changes in experienced support, and feeling of solidarity and loneliness, you can do so in the text box below:

Since mid-March, after the COVID-19 outbreak, you have had to follow distance education. We are curious about your experiences with possible support from the university.

In which areas do you need/have you needed support from the university after the COVID-19 outbreak? (multiple answers possible)

- ☐ Contact with fellow students
- ☐ Contact with lecturers
- ☐ Mental well-being (e.g. sleeping problems, anxiety, depression)
- ☐ Daily structure
- ☐ Motivation
- ☐ Concentration problems
- ☐ Drug use (e.g. alcohol, drugs)
- ☐ Technical support (e.g. internet, software problems)
- ☐ Financial support
- ☐ Otherwise, namely
- ☐ I don't need any support from the university

Were you able to find this support for the areas you needed?

	Yes	No
[HULPUNI1=1]Contact with fellow students	○	○
[HULPUNI1=2] Contact with lecturers	○	○
[HULPUNI1=3]Mental well-being (e.g. sleeping problems, anxiety, depression)	○	○
[HULPUNI1=4]Daily structure	○	○
[HULPUNI1=5]Motivation	○	○
[HULPUNI1=6]Concentration problems	○	○
[HULPUNI1=7]Resource usage	○	○
[HULPUNI1=8]Technical support (e.g. internet, software problems)	○	○
[HULPUNI1=9]Financial support	○	○
[HULPUNI1=10]Other, namely: ^HULPUNI1and;	○	○

If you were looking for help from the university, where would you look for it?
(multiple answers possible)

- ☐ On the Tilburg University website
- ☐ On CANVAS
- ☐ On social media of Tilburg University (Facebook or Instagram)
- ☐ Ask my lecturer(s)
- ☐ Ask the student counselor(s)* of the university
- ☐ Ask my fellow students
- ☐ Ask the study associations
- ☐ Ask the student associations
- ☐ Otherwise, namely

* mentor, education coordinator, dean of students, student psychologist, student chaplain, study choice or career coach

If you want to give more information about Tilburg University's range of support, you can do so in the text box below:

Since mid-March, after the COVID-19 outbreak, you have had to follow distance education. We are curious about your experiences with online education.

Indicate how you experienced different parts of online education in the period after the COVID-19 outbreak. If, for example, you did not have lectures, tick 'N/A'.

	Very negative	Negative	A little negative	Neutral	A little positive	Positive	Very positive	N/A
Lectures offered online	○	○	○	○	○	○	○	○
Online workgroups/practicals	○	○	○	○	○	○	○	○
Individual coaching (thesis supervision, internship coaching, project work)	○	○	○	○	○	○	○	○
Online Assessment	○	○	○	○	○	○	○	○

In what way do you think your study success has been influenced by the other form of assessment?

Very negative	Negative	A little negative	Remained the same	A little positive	Positive	Very positive	N/A
○	○	○	○	○	○	○	○

To what extent do you think you suffered a study delay due to the COVID-19 outbreak?

- ○ Not
- ○ A few months
- ○ Half an academic year
- ○ More than half an academic year, but less than one academic year
- ○ One academic year
- ○ More than one academic year

Do you encounter problems studying from home in the period after the COVID-19 outbreak? If so, in which areas?

	Never	Sometimes	Occasionally	Often	Always
Concentration problems and distractions caused by the surroundings of your study place (way in which study place is set up, distractions caused by family members/roommates)	○	○	○	○	○
Concentration problems and distractions caused by fretting and worrying	○	○	○	○	○
Technical problems (bad internet connection, no working camera, software problems)	○	○	○	○	○
Lack of a suitable workplace	○	○	○	○	○
Reduced motivation	○	○	○	○	○
Missing contact with fellow students	○	○	○	○	○
Missing contact with lecturers	○	○	○	○	○
Too little time due to increased (informal) care responsibilities	○	○	○	○	○

Are there any other problems you're running into?

If you experienced problems, what action did you take to solve them?
(multiple answers possible)

- ☐ I didn't look for help
- ☐ Looked for help from fellow students
- ☐ Looked for help from lecturer
- ☐ Looked for help from education coordinator
- ☐ Looked for help from student deans or psychologists
- ☐ Looked for help from other student counselor(s)* at the university
- ☐ Looked for a new place to work (e.g., with family)
- ☐ Investigated possibilities to study on campus anyway
- ☐ Organized or attended alternative (online) meetings with students/lecturers (such as a thematic meeting or pub quiz)
- ☐ Otherwise, namely

* mentor, student chaplain, study choice or career coach

Are there any positive aspects to studying from home for you?
(multiple answers possible)

- ☐ Less travel time
- ☐ More freedom of daily schedule
- ☐ More motivation
- ☐ More concentration due to fewer distractions
- ☐ Otherwise, namely
- ☐ I'm not experiencing any positive aspects

When the COVID-19 period is over, which form of education do you prefer?

- ○ Especially on campus (as before the COVID-19 outbreak)
- ○ Especially online (such as during the COVID-19 outbreak)
- ○ Combination of online and on-campus education (*Blended* education)
- ○ Otherwise, namely

Do you have any other comments or remarks about digital education and distance learning (lectures, work lectures/practicals, exams, etc.)? Which advantages and disadvantages do you experience?

Do you have any additions or comments to this questionnaire? Then you can report these here:

AFSLUITING

Dit waren alle vragen. Hartelijk dank voor je deelname. Door jouw antwoorden weten we meer over hoe studenten zich voelen tijdens de COVID-19-uitbraak en hoe het digitale onderwijs en studeren vanuit thuis ervaren zijn. Voor eventueel vervolgonderzoek zijn we tevens op zoek naar studenten die deel willen nemen aan een interview. Bij belangstelling kun je hiervoor mailen naar studentmonitor@tilburguniversity.edu.

Maak je je zorgen om je eigen mentale gezondheid of die van een ander? Kijk op www.thuisarts.nl voor informatie en tips om klachten te verminderen. Als je (anoniem) online wilt chatten, mailen of bellen, bezoek dan www.mindkorrelatie.nl.

Je kunt bij vragen over je mentale gezondheid, middelengebruik of zorgen om anderen ook altijd contact opnemen met studentbegeleiders van Tilburg University. Zie hiervoor https://www.tilburguniversity.edu/nl/studenten/advies.

Appendix B – Background information: Countries

Figure 0.1. Countries where students lived before starting their studies in Tilburg in percentages (n = 2203)

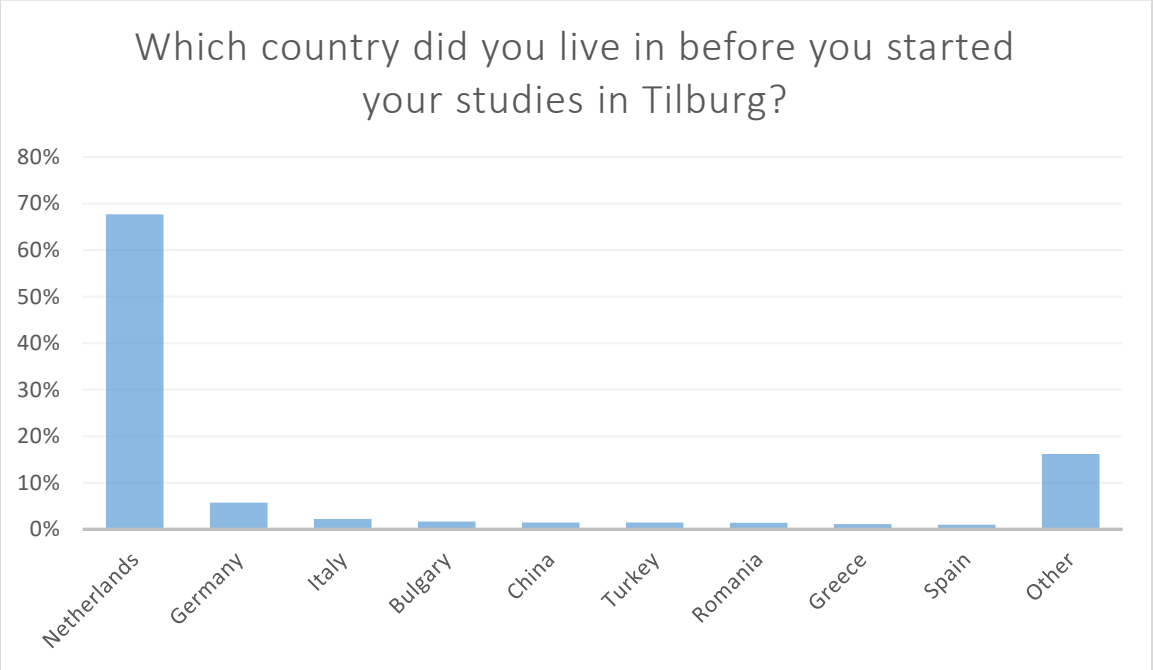

Figure 0.2. Countries where family members lived with whom students had the most contact in percentages (n = 2196)